



Wide World Photo

Welcome Home!

Former hostage Steve Kirtley of Little Rock, Ark., waves a small American flag while George A. Persinger of Seaford, Del., looks on from the balcony of the Wiesbaden Military Hospital in West Germany last Wednesday. Their release from Teheran came after several major U.S. banks moved billions of dollars through a computer-driven funds transfer network to a Bank of England escrow account in London.

The banks involved generally observed a Treasury Department request that the details of the electronic funds transfer (EFT) be kept secret as the 52 returned hostages began a "decompression" period last week.

Former President Jimmy Carter had ordered U.S. banks to freeze Iranian assets pending resolution of the crisis. Spokesmen for the banks that transacted the EFT via a Federal Reserve System transatlantic link refused to specify the exact amount wired, but informed estimates put the figure at roughly \$8 billion. That money will be held in the escrow account and applied against Iran's bank loans and other financial claims against the country.

COMPUTERWORLD

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DP Staffers Remain Tops In Demand

By Ann Dooley

CW Staff

PHILADELPHIA — The computer industry remains the land of opportunity for job seekers, as computer experts were rated the most sought-after employees in the U.S. again this year.

According to a nationwide survey of new hires conducted by Fox-Morris Personnel Consultants in conjunction with National Personnel Consultants, Inc., computer professionals were named as the employees most in demand for the fourth year in a row. Corresponding information from two other recruitment firms also shows a continuing demand for high-tech personnel — especially executives — in 1981.

(Continued on Page 6)

IBM Boosts Series/1 DDP

By Tim Scannell

CW Staff

ATLANTA — IBM last week strengthened its small-computer thrust into distributed data processing (DDP) by announcing a number of hardware and software communications network enhancements for its Series/1 mini-computer.

In basic terms, the system additions consist of two processors — one that doubles the previous memory of the

(Continued on Page 4)



Wide World Photo

Were You Invited?

Tuesday was Inauguration Day for Ronald Reagan, but for others it was Aggravation Day when they didn't get tickets they had been promised for Inaugural events. Story on Page 2.

User Threatens Suit Over Ansi Cobol-80

By Rita Shoor

CW Staff

HARTFORD, Conn. — At least one end user here threatened a class action suit against members of the American National Standards Institute (Ansi) X3J4 committee if they support Cobol-80 as it now stands.

The proposed X3J4 standard is reportedly incompatible with the 1974 version of Cobol, and litigation is apparently a possibility if things do not change, based on a letter from J.T. Brophy of Travelers Insurance Companies to J.T. Panttaja, X3J4 chairman.

"We must go on record as being unalterably opposed to this [Cobol-80] standard because it does not provide complete upward compatibility,"

Brophy, a senior vice-president with the insurance firm, stated.

He pointed to past conversions that had been imposed on Travelers, along with other DP users, because of programming language incompatibility.

"These conversion efforts were nonproductive and resulted in a total waste of our programmer resources for extended periods of time," the letter continued.

Another conversion would probably be a major undertaking, considering the firm's more than 30,000 production program modules containing almost 40 million lines of Cobol code. "The prospect of changing these programs is in-

(Continued on Page 8)

Equipment Vendors Favor Bell Settlement, But Carriers Balking

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Independent manufacturers of on-line computer systems and intelligent terminals are willing to go along with a proposed settlement of the Justice Department's antitrust suit against AT&T, but specialized carriers are not. At least that is what knowledgeable sources said last week, several days after argument in the "antitrust trial of the century" was halted by presiding Judge Harold H. Greene. The interruption came when attorneys for both sides told the judge they had agreed on essential details of a negotiated settlement.

Judge Greene has given the attorneys until Feb. 2 to get this tentative agreement approved by AT&T's front office and by the new Reagan administration. If that deadline is met, the trial will be delayed another 30 days to allow drafting and approval of a final consent decree. If the Feb. 2 deadline is not met, the trial will resume.

However, even if the deadline is met, it will take a while to settle the case. For one thing, interested parties are entitled to comment on the terms, and at least one group — the Ad Hoc Committee for Competitive Telecommunications (ACCT), which represents the nation's specialized carriers — has already told the Justice Department that the proposed settlement does not go far enough.

(Continued on Page 6)

A Day In Court

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — What has been called the antitrust trial of the century — U.S. vs. AT&T — was halted

Additional coverage on AT&T and the antitrust settlement on Pages 10, 11 and 12.

here Jan. 16, one day after oral arguments began, when Justice Department and AT&T attorneys told presiding Judge Harold H. Greene they had agreed on "essential details" of a negotiated settlement.

Judge Greene gave the lawyers until Feb. 2 to put this agreement into writing and get it approved by AT&T's top management and the incoming Reagan administration. If that deadline is met, Justice and AT&T's attorneys will have until March 4 to produce

(Continued on Page 5)



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Procedures, Not Computers, Blamed Inaugural Ticketing System Snafus

By Deborah Wise

CW Staff

WASHINGTON, D.C. — A "failure in ticketing operations" was the reason for hot tempers at some of last week's Inaugural events here, according to a spokesman in the Inaugural Committee's security department. It was the first time ticketing was handled by computer technology and text-processing techniques, but last-minute changes in procedure left many invitees without tickets.

Bowen Information Systems set up a bank of five CRT terminals and five hard-copy terminals at the Inaugural Committee headquarters at Fort McNair here that interfaced with two IBM 370/155 computers at Bowen's New York office.

The committee was supposed to handle more than 450,000 names and addresses keeping records of the invitations for the nine Inaugural balls, the pre-Inaugural gala, the candlelight dinners at the Kennedy Center and the many receptions and concerts held in Washington, D.C., last week.

According to Dick Leonard at Bowen, the committee had fears that some of the events would not be well-attended and sent out last-minute telegram invitations and issued corporate invitations in block sales.

The central computer facility was not informed of the operations and, as the responses were overwhelming, this contributed to the confusion over the issuing of the invitations.

According to a spokesman at the Inaugural Committee, some of the 175,000 tickets that were sent out were issued to the wrong people and delegates entitled to VIP treatment were not sent their invitations.

Tickets that missed mailing deadlines were supposed to be hand-delivered to a Willcall center and set up at Union

Station here, where they could be collected. Walter Gold, director of the Willcall operation, said there were major problems, but could not verify their nature. He expected a full report by the end of the month.

A volunteer at Willcall said that 10 days before the festivities began, only a quarter of the invitations had been delivered to Union Station which had two CRT terminals keeping track of the sales and issuing.

New, Small Users Warned: Beware IRS on DP Records

WOBURN, Mass. — Smaller companies following the lead of the larger ones in switching to computerized accounting systems should make certain their systems meet the DP recordkeeping requirements of the Internal Revenue Service (IRS).

A 1980 IRS Revenue Ruling, a reaffirmation of a 1971 ruling with one glaring omission, has made it "clear that the IRS is not playing games about the need for appropriate [DP] records," according to a recent article in "Computer Law and Tax Report" (CLTR).

New and small users of computerized accounting systems should therefore strike a written accord with the IRS as to what tapes, disks and punchcards need be kept to comply with federal tax law, CLTR said. Many such users may be unaware of the IRS ruling, unlike the larger companies.

The 1980 ruling, part of the Crude Oil Windfall Profit Tax Act, differed from the earlier ruling by omitting the following: "It is the desire of the Internal Revenue Service to provide fair and equitable treatment to all taxpayers using ADP accounting systems and to minimize undue hardships of ADP recordkeeping."

Wilson Sadely, IRS public information officer, said there is "nothing at all to imply [from the omission] except

that it is a generalized statement of IRS policies toward all tax paying entities."

CLTR said the omission could forecast a change in attitude toward a stricter enforcement of IRS rulings related to computerized accounting users. To hedge against this possibility, the CLTR suggested tax departments and accountants get proper IRS approval of DP operations.

In essence, a company with deficient DP accounting records could leave itself vulnerable to a damaging IRS audit. "In plain English, if you don't have a written agreement with the IRS, they can really blow you apart," a tax attorney here said.

The IRS first issued guidelines to DP accounting system users in 1964, rendering a more detailed version in 1971. The latter ruling specified the range of electronic records that must be kept by taxpayers. Although the statute of limitations for tax returns expires three years after the due date of the return, tax records should be kept "until they are no longer needed in figuring taxes," the IRS said.

The 1971 ruling did not, however, specify a universal code of what records need be retained by all computer accounting users. Instead, it specified a format whereby individual taxpayers and the IRS can work out an agreement as to what records need be kept.

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Jim Orgill, Director of Data Processing

ADR's integrated software expands productivity and progress at Wright Schuchart, Inc.

PRODRESSES

ADR's Integrated software improved DP services.

According to Jim Orgill, Director of Data Processing, "We've been on a fast track for the last year-and-a-half in improving our DP services. We've been able to accomplish with a very small systems development staff what other companies might require 30 or 40 people to achieve. We couldn't have come so far so quickly if it weren't for ADR software. We have DATACOM/DB and DC, DATADictionary, DATAQUERY, ROSCOE and The LIBRARIAN and plan to add other ADR products in the near future."

ROSCOE reduced turnaround time from two days to 12 minutes.

According to Ron Higgins, Manager of Technical Services, Wright Schuchart had been experiencing two-day turnaround in testing. "A programmer would keypunch his deck, submit it to operations and wait for a printout. After we installed ROSCOE, turnaround time went down to 12 minutes."

ADR product integration made job 10 times easier.

"We brought in ROSCOE and The LIBRARIAN about a year ago," Mr. Higgins went on. "They worked so well together that when we looked into a DBMS we asked ADR to be part of that review. One of the vital reasons for choosing ADR was the fact that they build integrated products. It didn't make sense to us to get a data dictionary from one supplier and a data query from another. We wanted software designed to work together, a good example being DATADictionary's integration with The LIBRARIAN. I honestly feel that ADR's integrated products made our job at least 10 times easier."

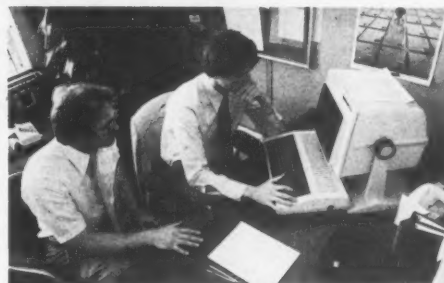
Better support from ADR than any other vendor.

"After ADR installed the initial products," Mr. Higgins continued, "everything worked fine. Then we accidentally clobbered the system. ADR could have told us it was our problem,

not theirs. Instead, they came back, re-installed the software and re-educated us. We've received better support from ADR than any vendor I've ever dealt with."

Instant information with ADR Data Base Management software.

"We're now beginning to make effective use of DATACOM/DB and DC, DATADictionary and DATAQUERY," Mr. Orgill stated. "For example, when the payroll clerks want to find out what construction job one of our thousands of workers is on, they just use DATAQUERY to get the information from DB. Before they'd have had to go through stacks of old reports which could take forever."



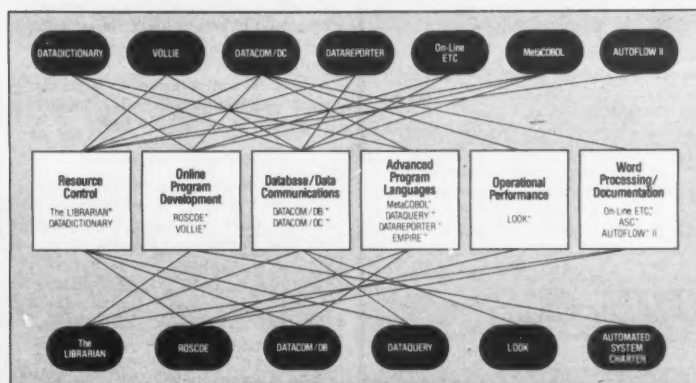
Ron Higgins, Manager of Technical Services (right) and Carl Brockman, Systems Programmer

Productivity climbing.

"Productivity is increasing tremendously," Mr. Orgill concluded. "I give the credit to my staff and to ADR products."

95-year old Wright Schuchart, Inc., is as much a Seattle landmark as the city's famous space needle, which the company built. The 50th largest U.S. contractor is a leading builder of high-rise office buildings, paper mills, and nuclear energy facilities. The company's DP department employs 21 people, operates an IteL AS4, 3330 Model 11 disk drives, has eight terminals inhouse and three at remote construction sites.

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IBM Offerings Punctuated by Printer Debuts

ATLANTA — IBM bracketed its communications announcements last week by introducing a number of printers aimed at speeding output.

For the Series/1, IBM unveiled a family of matrix printers with a variety of printing speeds and local and remote features. The model 4975 printer offers speeds ranging from 40- to 160 char./sec. In addition, two models of

the four-model line can be switched from draft to correspondence-quality printing through Series/1 software.

The 4975 printers will be available in August at prices ranging from \$2,500 to \$3,650.

The IBM 5219 impact printer, targeted for the 5520 Administrative System is a desktop machine featuring increased flexibility in paperhandling,

typefaces and print speed, an IBM spokesman stated. The printer uses a bidirectional printwheel and offers continuous forms feeding as well as automatic, dual-drawer sheet feeding options.

The 5219 comes in two models — offering a print speed of either 40- or 60 char./sec — and a choice of 10 typefaces. The Model B01 has a purchase price of \$5,050 and a lease price of \$200/mo, while the faster Model B02 costs \$5,450 and leases for \$217/mo. Deliveries for both printers will begin in October.

Condensed Printing

Also in regard to the 5280, IBM introduced an impact matrix printer that features both a standard printing capability and a condensed printing function, with full-speed printing independent of character set size. The 5224 printer can also be used with IBM's System/34.

The 5224's condensed printing capability allows a full-size computer

printout to be printed on typewriter-page-sized paper. Up to 198 printing positions can be created to generate statistical, financial or industrial reports, the spokesman noted.

The 5224 Model 1 costs \$6,150 and can be leased for \$237/mo while the 5224 Model 2 costs \$7,000 and can be leased for \$270/mo. Deliveries are scheduled to begin in November.

IBM wrapped up its printer introductions by debuting a high-speed printer for the System/38. The 3203 Model 5 prints up to 1,200 line/min and features a power stacker. Up to two of these printers can be linked to a single System/38 processor.

The 3203 costs \$41,050, can be leased for \$1,545/mo or rented for \$1,731/mo. Deliveries of the printer are slated for March.

Finally, IBM reduced the purchase price of its previously announced 5257 impact printer from \$7,725 to \$5,450, noting that there will be no additional charges for the printer's column manipulation feature support.

IBM Boosts Memory, Communications on 5280

By Tim Scannell
CW Staff

ATLANTA — IBM's 5280 distributed data system received a communications shot-in-the-arm last week when, the firm introduced increased memory capacities and a number of additional communications features for the terminal-based 5280 system line.

The firm unwrapped new models of its 5285 and 5286 dual programmable data station and 5288 programmable control unit. The boosted memory allows up to 96K characters of information to be stored on both the 5285 and 5286. Previous models of the two machines had memory capacity of 64K.

In addition, the IBM 5288 now has memory capacities of 229,376 or 294,942 characters of information. The 5288's previous memory limit was 163,840 characters.

Features announced by IBM's General Systems Division (GSD) for the 5280 family include a communications feature that allows 5285 or 5288 terminals to appear as IBM 3270 terminals, delivering increased communications flexibility; and a second application microprocessor for the 5280, providing additional processing power.

Lease charges for the five new models of the 5285 range from \$206/mo to \$276/mo. Purchase prices range from \$6,730 to \$9,015. Deliveries for these systems are slated to begin in March.

Lease charges for the two new models of the 5286 range from \$244/mo to \$276/mo. Purchase prices range from \$8,620 to \$9,870. Deliveries also begin this March.

The 28 new 5288 models lease for prices ranging from \$284/mo to \$501/mo. Purchase prices range from \$9,855 to \$16,695. Deliveries begin in June.

IBM Upgrades Series/1 to Beef Up DDP

(Continued from Page 1)

Series/1 — a cluster-type communications controller, a communications monitor and several communications software packages.

However, from an end-user viewpoint, the recent announcements mean that up to 16 Series/1 computers can now be joined in a cluster or ring formation to exchange data and perform other processing functions.

The first processor, the 4952 Model C, is an entry-level machine outfitted with up to 128K bytes of main storage and geared to be used as a network node or stand-alone system, an IBM spokesman said. The system also features an integrated disk drive unit.

Along with the Model C, the firm introduced the 4955 Model F, which has 512K bytes of main storage, double the capacity of previous Series/1 proces-

sors. In a nutshell, additional storage on the 4955 means more active terminals on the Series/1 and the capability for system expansion, the spokesman added.

Software support for the 4955 includes Realtime Programming System Version 5, Event Driven Executive Version 3 and Control Program Support.

The 4955 will be available in April, while the 4952 Model C processor will be ready for shipment in August. Prices range from \$8,500 to \$11,550.

Communications Controller

The Series/1 local communications controller is intended for high-speed serial data communications between two or more processors and allows up to 16 computers, each with its own controller, to be attached in a ring data link. This grouping is accomplished without the need for a primary station, the spokesman said. By using the controller, the Series/1 can accommodate high-speed, memory-to-memory data transfer between two or more processors.

From a technical standpoint, the controller allows Series/1 systems to communicate using a peer-to-peer full-duplex protocol as well as access files, data or resources, the spokesman continued. Each unit is reportedly capable of directing messages to any other connected to the ring and can selectively broadcast to any or all of the units on the ring through user-written programs.

The local communications controller costs \$3,825 and will be available in August.

Communications Monitor

Still leaning on the network angle, IBM also introduced a communications monitor that is geared to manage the flow of messages between processors and devices in a Series/1-controlled network. The licensed software program is said to provide all the functions of the previous version and new device support, a high-level language interface and several other enhancements.

The monitor will be available in March and sells for a one-time charge of \$5,280.

Finally, with an eye toward continued beefing-up of the Series/1 communications software, IBM unveiled a Realtime Programming System/Systems Network Architecture (SNA) extended support option, which is said to enhance the overall usability of the Series/1's base operating system's SNA support. Briefly, the package provides the computer with a Get/Put-level interface to IMS/VS and CICS/VS application programs in the host.

The one-time fee for the extended support option is \$2,784 and it will be available sometime this month.

Software Updates

In addition, the firm announced a Realtime Programming System/Multiple Terminal Manager Version 2 for the Series/1, which includes IBM 3270 emulation upstream to a host system and additional terminal support, Indexed Access Method Version 2 and Cobol Version 2.

Indexed Access Method Version 2 is designed for both Series/1 operating systems — Realtime Programming System and Event Driven Executive — and supports all the functions in the previous version. The difference, however, is that the newest version has multiple index support, a data paging function and an enhanced Indexing Access Method utility function.

Cobol Version 2 is also available for both Series/1 operating systems and includes such key functions as logical connectives and blocking of relative files.

The one-time charge for a development system license for the terminal manager, available immediately, is \$15,000. The Indexed Access Method and Cobol versions 2 are priced at \$1,440 and \$4,512 for a one-time charge, respectively. Both software packages will be available this August.

Additional information on IBM's Series/1 enhancements and product announcements can be obtained from the firm's General Systems Division, P.O. Box C-1645, Atlanta, Ga. 30301.

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Delivery of SNA/SDLC Support Hastened System/38 Gains BSC, Productivity Aids

By Tim Scannell

CW Staff

ATLANTA — At the same time IBM announced a beefing-up of its Series/1 computer it also unveiled a Binary Synchronous Communications (BSC) support feature for the System/38 as well as additional communications hardware for the mid-range processor.

In addition, the firm released a number of software programmer productivity aids and moved the delivery date up on a previously announced communications product.

The BSC feature, which will be available for the System/38 in the first quarter of next year, will reportedly allow the computer to communicate with other System/38s, IBM computers and terminals over ordinary telephone lines. These computers and terminals include IBM's 4300 and 30 series of machines and IBM's 3741,

5230, 5280 and 5260 terminals.

The BSC leases for \$75/mo, rents for \$86/mo or can be purchased for \$2,925.

Sharing the limelight with the BSC support feature, IBM's communications attachment increases the number of communications lines on the System/38 from four to eight, to facilitate more I/O pathways, a spokesman noted. IBM also unveiled two additional workstation controllers that are said to permit up to 80 Model 5250 Information Display System devices to be directly attached to System/38, doubling the previous number.

Prices for the workstation controllers and communications attachment are

the same as those of the current products, the spokesman said. The communications attachment leases for \$22/mo, rents for \$25/mo and can be purchased for \$780. The workstation controller prices are \$135/mo for lease, \$155/mo for rent and \$5,070 for purchase.

IBM's programmer productivity aids, available in March, include enhancements to the Interactive Data Base Utilities (IDU). A new Source Entry Utility (SEU) user interface and a Data Base Logging feature that, along with a Log Recovery feature, provides a means for logging and recovering interactive data base jobs. The latter features reportedly free the user from

performing those chores.

Finally, IBM announced a System/34 to System/38 conversion aid to assist in converting application code for use on the System/38. The conversion aid will be available this September.

The one-time charge for the conversion aid is \$1,300. Monthly charge for the Interactive Data Base Utility is \$65 while the logging recovery software costs \$50/mo.

Finally, focusing on delivery dates, IBM announced that the availability of the SNA/SDLC communication support for the System/38 as a terminal to IBM 370 processors has been moved up three months from June to March 1981.

U.S. vs. AT&T: A Day in Court

(Continued from Page 1)

the full text of a tentative consent decree: They must also persuade the White House and AT&T's front office to approve it by then.

If either of these deadlines is not met, the judge added, the trial will resume immediately.

Reporting that he had met earlier with Justice Department and AT&T representatives in chambers, Judge Greene said in a five-page memorandum order that he had been advised the settlement may be "characterized as essentially complete."

By Feb 2, Judge Greene "expects" AT&T Vice-President and General Counsel Howard J. Trienens and "the new attorney general or his designee" to file statements with the court which obligate both the government and the telephone company to "support the settlement framework as it existed on Jan. 14 with whatever changes or additions the parties may have agreed to since then."

Also, both parties must state that they believe "this framework can be transformed into a consent decree... within 30 days thereafter," and that "they will commit the resources necessary to effect this transformation," Judge Greene said.

The trial began in 1974 and so far has cost AT&T \$250 million, the company said. The government reportedly has spent about \$10 million.

The government asserts that AT&T — through its 23 operating companies, Long Lines Department, Western Electric and Bell Laboratories — violated Section 2 of the Sherman Antitrust Act during a 10-year period that began in 1968.

AT&T's basic defense is that whatever it did was legal under the Communications Act of 1934 and subsequent FCC rulings: That in any event, these actions were condoned by the FCC, thus immunizing the company from prosecution under the Sherman Act. AT&T also argued that divestiture, as proposed by the government, would destroy "the most advanced, efficient and successful communications system in the world."

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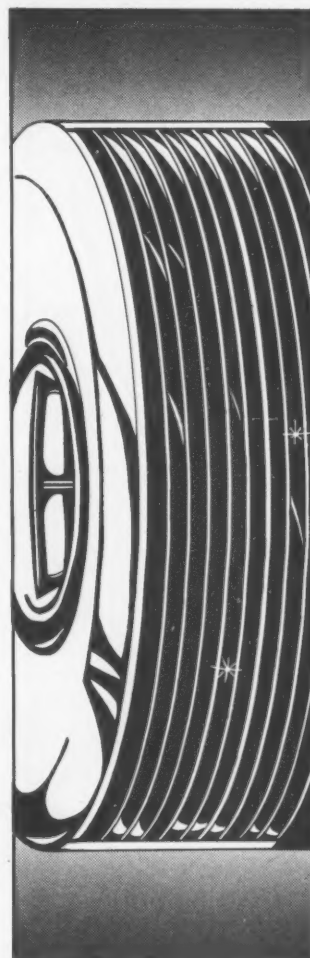
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CW 1/26/81



Computer Pros Hot Item For Fourth Year in a Row

(Continued from Page 1)

The overall demand for computer professionals will rise 25.6% above 1980 levels, according to the Fox-Morris survey in which 4,670 U.S. employers were polled. This figure indicates an increase over last year's record rise, which was listed at 18.7%, according to Fox-Morris.

Demand for Programmers

Although computer professionals at every level will be in high demand, employers will find themselves most in need of computer programmers, with 1981 new hire demand projected to escalate 35.6% above record 1980 levels, the survey showed.

Others in high demand will be software engineers, systems analysts and management-level personnel with computer knowledge, including data base managers and corporate directors. Vice-presidents, especially those with backgrounds in mainframe and distributed data processing computer combinations will also be sought by businesses around the country.

Other professionals that are in demand are financial vice-presidents, who as a group will experience an 18% rise in demand in cost-conscious 1981, and auditors, especially those experienced in the use of DP techniques.

The Fox-Morris survey indicated that the chief executive officer with a strong generalist's grasp of the entire corporate picture will continue to be in short supply. Women, too, are expected to be moving in a continued upward track to the executive level, the survey claimed.

The Fox-Morris survey — which was uniformly optimistic — found that even those without on-the-job experience will fare well over the next 12-month period. Computer science graduates have seen their salaries jump more than 40% in the last three years, according to survey statistics.

Computer programmers experienced

a 35.6% increase in demand while that for systems analysts will rise 24.1%, according to the survey. Employers' need for data base managers will rise 20.6% in 1981, respondents indicated.

Projected salaries will keep pace with occupational demand, the survey showed. Corporate management information systems directors can expect to earn \$50,000 on an average across the country, according to the survey. Systems analysts with two to five years of experience can expect to earn an average \$25,650. Employers in the survey indicated the average salary of programmers in 1981 will be \$23,500.

The survey statistics, however, may not necessarily reflect a complete overview of DP professionals because only those firms doing business with the personnel agencies were questioned.

Vendors Favor Settlement, Carriers Don't

(Continued from Page 1)

Also, the settlement cannot become final until Judge Greene accepts it; before making up his mind, he may ask for additional written evidence from either or both sides and may conduct further oral hearings to obtain testimony from witnesses.

The Reagan succession creates a special problem because Judge Greene's order requires the new administration to officially endorse the proposed settlement terms by Feb. 2. Incoming Attorney General William French Smith announced during his Senate confirmation hearing that he will totally disassociate himself from the case; he was until recently a director of Pacific Telephone and Telegraph Co., one of the defendants. No deputy or associate attorneys general have been named yet, and even if they are selected within the next few days, they must be confirmed by the Senate before taking office.

One question that remains to be answered, if and when government and

NEW YORK — The need for computer experts continues to spiral in 1981, but employers — although expecting to increase their new hires — view the increased demand as aggravating an already difficult hiring situation.

These are the findings of a semi-annual "Employment-Level Forecast Survey" of 301 business and industrial organizations by Deutsch, Shea & Evans (DS&E), a recruitment and consulting firm based in New York.

Of the respondents polled, only 4% predicted a drop in their current DP staff of programmers and analysts, 43% saw increases in their computer work force and 44% expected employment of this group to remain at its present level.

A substantial percentage of the responding companies expected to in-

crease college hiring in what is already a highly competitive arena for new talent, according to DS&E. Close to a third, 30%, expected to add more new graduates this year than last; 39% planned to hire the same number as last year; 15% expected to reduce campus hires; 10% said they do not hire new graduates and 5% are still undecided.

The 1981 employment predictions are more optimistic than in the last half of 1980, but strikingly resemble the forecasts for the beginning of that year, the recruitment firm said.

The recessionary economy has had little effect on the prospective high demand for computer professionals, but surprisingly, the change in administration to a business-oriented president has caused less of an impact than expected, DS&E said.

AT&T lawyers hammer out a detailed settlement in writing, is whether it will be accepted by the federal district court in New Jersey that has jurisdiction over the consent decree AT&T signed in 1956 after an earlier antitrust case.

A key provision of that 1956 agreement bars the phone company, with certain minor exceptions, from offering anything but regulated communication services. Reportedly part of the current settlement would erase this provision by allowing AT&T to offer "enhanced" services on an unregulated basis through a separate subsidiary.

These enhanced services include computer-based on-line information offerings, such as store-and-forward electronic mail, and others such as Advanced Communications Service (ACS) which perform the speed, code, protocol and message-code conversion functions needed to interface different types and makes of dumb and smart

terminals. Until the Federal Communications Commission's (FCC) recent Second Computer Inquiry decision, these functions were generally regarded as DP, rather than communications. Although at least one major computer trade association has now apparently changed its mind (see story on Page 10), there is no certainty the New Jersey court will do likewise.

Assuming Judge Greene gives his blessing to the separate subsidiary idea, it will almost certainly have to be approved also by the New Jersey court. That would give opponents another opportunity to attack the scheme.

Major Factors

Two factors seem to have produced the tentative agreement: a desire by the incoming Reagan administration to get the case over with (it was begun in 1974), and AT&T's desire to hedge its possible losses.

If Bell loses the case after any witnesses take the stand, the decision — as well as those witnesses' testimony, together with related material — can be used by other plaintiffs who have filed antitrust charges against the phone company.

However, according to a former Justice Department attorney, this threat is more apparent than real, since virtually all of the material to be presented in the early stages of the trial is already in the public record: it consists of FCC decisions and material from the case MCI Communications Corp. prosecuted against AT&T and won last year in Chicago.

All of which suggests that the Reagan administration's views may be the predominant motivating force.

AT&T has appealed the MCI verdict, as well as another adverse judgment won earlier by Northeastern Telephone Co. in Bridgeport, Conn., and Bell may believe that by settling with the government now on the basis of the terms that have reportedly been negotiated, it will stand a better chance of winning these two appeals.

Money is a related consideration; in Chicago, MCI was awarded treble damages amounting to \$1.8 billion, with interest until the money is actually handed over. It is the largest antitrust damage awarded in history.

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Xerox Expected to Follow Suit

Tymshare Plans to Be Among First With DTS

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Tymshare, Inc. will be among the first companies offering Digital Termination Service (DTS), a new local distribution scheme for data communications users which was established earlier this month by the Federal Communications Commission (FCC).

A high-ranking Tymshare spokesman, pointing out that his company is already a partner of Satellite Business Systems (SBS) and others in an upcoming transcontinental transmission trial that will utilize cable and microwave local loop facilities in San Francisco and New York, said the first step in exploiting the recent FCC decision would be to apply for DTS frequencies to support the trial.

He indicated Tymshare would apply as soon as possible for licenses to operate microwave local distribution facilities "in more than 30 cities."

Another early entrant is likely to be Xerox Corp., which began the FCC proceeding in 1979 by unveiling its Xerox Telecommunications Network (Xten). "You can expect an announcement from us shortly after the text of the FCC ruling is released," a Xerox spokesman said. The text is expected to be out next month.

He explained that Xerox's DTS will be conditioned by a number of questions likely to be addressed in the text, such as the number of cities a nationwide DTS carrier must serve, whether and to what extent large companies — such as Xerox and AT&T — will have to offer DTS through separate subsidiaries and whether the service can include voice as well as nonvoice applications.

An FCC source, in answer to a question from *Computerworld*, said Xerox will not be required to offer DTS through a separate subsidiary, but AT&T — as a result of the Second Computer Inquiry Decision — will have to do so.

Emerging Services

The DTS ruling is important because it seems likely to accelerate the development and marketing of electronic mail and message, videotex, teleconferencing and other emerging data communications services for the home and business. One existing constraint on these offerings is the low speed and poor quality of telephone company-provided analog local loops when used for transmission of digital information.

Also, deployment of DTS networks throughout the nation would threaten the last redoubt of AT&T's network monopoly: That could lead to changes in services and pricing for all telecommunications users.

The FCC ruling allocates 130 MHz of radio frequency for a Digital Electronic Message Service (Dems), which is divided basically into two parts: intercity terrestrial and/or satellite facilities, already provided for in other FCC rules, and the DTS local distribution network. The allocated frequencies are in the 10.55 to 10.68 GHz band.

One version of DTS is Xten, which consists essentially of low-power transceivers connecting users within a metropolitan area to central gateway

through which they can communicate with distant cities.

Under the FCC order, other local distribution architectures besides Xten are permissible, but all of them must employ radio frequencies between 10.55 and 10.68 GHz. Cable-based local area networks, however, could be interconnected with DTS facilities.

This may give Xerox a competitive advantage, since its Ethernet local area network has been installed in several locations and is being aggressively marketed.

Key Provisions

Other key provisions of the FCC ruling include:

- Of the total 130 MHz allocation, 70 MHz was earmarked for the links connecting subscribers to local nodes. Another 30 MHz will provide inter-nodal links, and the remaining 30 MHz will be kept in reserve to meet future needs.

- Providers of extended DTS will receive 40 MHz of the end-link frequency allocation, while those offering limited DTS will receive the other 30 MHz.

- The former carriers must offer service in at least 30 cities, the latter in up to 30 cities. Limited Service end links will have a subdividable 2.5 MHz bandwidth in either direction, while Extended Service links will be 5

MHz.

- Up to four Extended Service carriers and six Limited Service carriers will be licensed in each city. In the case of competing applications, Extended Service carriers will be favored.

- The FCC staff is now preparing a Notice of Proposed Rule Making which will recommend to the commission means of allocating a second frequency band — 17.7- to 19.7 GHz — for DTS.

This proceeding is intended, among other things, to provide additional transmission capacity if and when the 10.55- to 10.68 GHz band becomes loaded, a spokesman said.

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K 2

'Cars' May Give GOP Edge in Redistricting

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Technological superiority, more funds and greater numbers of incumbent Republicans may combine to give the GOP the edge in the upcoming redistricting battles to be fought in the 50 state capitols this year.

While a formal, concerted effort on the part of the Democratic National Committee (DNC) to help states draw up boundaries is still "in the talking stage," according to a DNC spokesman, the Republican National Committee (RNC) has developed its own software package designed to map out districts for the states. Expected to be utilized by some states as early as next month, the Fortran-based Computer-Assisted Redistricting System (Cars) takes advantage of color graphics and digitized input to create the maps, according to Ron Charnock, director of the RNC's Computer Services Division.

States already have access to the RNC's sophisticated computer system, at an average cost of \$250- to \$300/month — about 50% cheaper than commercial prices, Charnock noted. That technology — which far surpasses the DNC's dependence on service bureaus — coupled with the 1980 census figures, is expected to provide the ammunition the party

needs to win state redistricting skirmishes.

The final census figures — also encouraging to the Republicans — mean a loss of congressional seats in urban, usually Democratic areas, where population has declined. Most of the 17 House seats in the North and Middle West that will shift to Sun Belt states will come from urban centers.

"New York will lose five, Illinois two, Ohio two, Pennsylvania two, Massachusetts one, Michigan one, New Jersey one, South Dakota one and Indiana is losing one," reported Jeff Solender, deputy treasurer of the DNC.

"Florida will pick up three, California picks up two, Texas two and Arizona, Colorado, New Mexico, Oregon, Tennessee, Utah and Washington pick up one each," he said.

Portable Software

The RNC's software, which is "highly portable," according to Charnock, could either be delivered to states for use on their own computers, or states could remotely access the committee's Digital Equipment Corp. 2060 with 512K words of main memory and 600M bytes of disk storage.

"We're tied into the Telenet network, so in the theoretical sense we're literally a local phone call away from any state party's being able to use the RNC's computer," Charnock said.

The number of states that actually take advantage of Cars will depend on the manpower resources, instead of computer resources, the RNC is willing to dedicate to redistricting, Charnock added.

"The big problem is not the computer," he noted. "The problem is developing the [state's] data bases necessary to do a good job with redistricting, and basically that boils down to marrying census geography with political geography." While the committee uses the computer to merge such data, "it still requires a lot of people time; for example, a lot of the digitization of mapping is done by individuals working with digitizers," he added.

Cash Assistance

Instead of extensive RNC manpower dedicated to redistricting, committee aid to the states may instead take the form of direct cash assistance to many states, he noted.

"It's very difficult for any one organization to support a large number of states, because all their redistricting needs occur at the same point in time," Charnock said.

For those states that do use the software, the input to the system will include three categories, he explained. The first category is the census data each state will receive, starting "some time next month" and finishing delivery after April 1.

Such data will reveal total state population as well as breakdowns into White, Black, Hispanic, Asian and "other" categories. While some states will receive the information on a precinct-by-precinct basis, others will

get it on a census tract basis or municipality basis, Charnock explained.

The second piece of data that goes into the system is past electoral information on a precinct-by-precinct basis, "such as the Carter-Reagan race, the Ford-Carter race or maybe a U.S. Senate race applicable to a particular state," Charnock noted.

Lastly, if the state's census information is not on a precinct-by-precinct basis, Charnock said, the software attempts to cross-reference the census tracts and political precincts. "We create a data file that marries the two so that now [the states] can do the adequate comparisons both politically and demographically," he added.

Creating Districts

Those primary data bases are then input into the Cars software, "which allows the user to create districts and understand both the political and demographic ramifications of those districts," Charnock noted.

The extremely complex rules governing redistricting — a process that follows every decennial census — were designed to guarantee, first of all, districts of fairly consistent populations within a state, Charnock explained.

In addition, districts should guarantee ease of access of all parts of the district to other parts of the district; for example, there should be no major geographic boundary within a district, he said.

Finally, states should not pack minorities into one district or split them up so there is no representation, he added. Compactness of a district is also preferable.

Sites Asked to Comment On Ansi Cobol-80 Standard

By Rita Shoor
CW Staff

How many Cobol programs in your installation use the ALTER statement? Do your shop standards require programmers to include author, installation, date written and/or date compiled in Cobol programs?

If the answer to the first question is "a lot of them" and the answer to question number two is "yes," you should be aware that these statements may disappear if the new Cobol-80 standard is adopted. Cobol-80, as currently proposed by technical committee X3J4 of the American National Standards Institute (Ansi), provides for deleting the ALTER statement, according to a report in the October 1980 issue of *Data Management*.

The previously cited statements would also be deleted from the Identification Division of a Cobol program and the standard calls for an additional 93 reserved words. However, no provision has apparently been made for upward compatibility to Cobol-80 from the 1974 version — a situation that has resulted in a strongly negative reaction from at least one very large Cobol shop (see article on Page 1).

Efforts to elicit a response to the proposed X3J4 standard from other Cobol users were largely unsuccessful possibly because, as one manager said, "we haven't been paying attention to it."

Computerworld would like to hear

what other Cobol installations have to say about the proposed version of Cobol-80. Please address replies to Rita Shoor, Senior Editor, Software and Services, CW, Box 880, Framingham, Mass. 01701.

Ansi May Face Class Action Suit

(Continued from Page 1)
comprehensible, and from a management standpoint is totally unacceptable," Brophy said.

"A massive change to a new standard would be disruptive, nonproductive and would stifle the progress of American business enterprises to improve productivity and recover the economy," he argued.

Travelers strongly recommended that the proposed Cobol-80 standard be rejected unless complete compatibility with Cobol-74 is achieved, he said. "For the X3J4 Committee to vote otherwise would be irresponsible, tantamount to dereliction and a reflection of its business immaturity."

Brophy ended the letter with an offer to cooperate with any group endorsing Travelers' position and indicated the possibility of a class action suit against individual committee members who support a Cobol-80 standard that is incompatible with Cobol-74.

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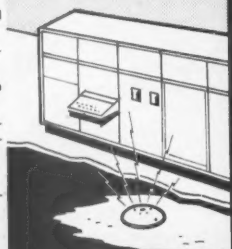
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Packages Cited for Keeping GOP Campaign Out of Red

By Marguerite Zientara

CW Staff

WASHINGTON, D.C. — The wealthy Republican National Committee (RNC) and Reagan-Bush Committee attributed their considerable success in financial management during the 1980 presidential campaign largely to a set of modified software packages.

Officials from the RNC's Computer Services Division began searching for an accounting package early in 1979 when the committee expanded its computer operations by purchasing a Digital Equipment Corp. 2040 computer, recalled Marcus Heth, director of systems/software for the division.

Recognizing the need for a package that was "efficient, economical and which could be used on a time-sharing basis," according to Heth, the officials "conducted a thorough investigation of the systems currently available."

That investigation resulted in choosing the accounts payable and general ledger packages offered by Timesharing Consultants, Inc. (TCI) of Tucson, Ariz. The choice was based on four basic criteria:

"First, TCI's software met the stringent audit and reporting standards required by today's political environment," Heth noted. Second, the packages were modular and could be easily modified to meet specialized needs such as a special reporting function required by the Federal Election Commission.

Third, Heth pointed out, both packages were designed on and for the Decsystem-20. Finally, the systems were easy to learn and operate, so the RNC could "quickly and efficiently" train a large number of operational and clerical personnel. "This last point was crucial because of the short, fixed time schedule placed on the RNC by the election," Heth observed.

During the election campaign, the RNC, with TCI's help, modified TCI's standard accounts payable and general ledger packages, followed by a testing period.

The RNC began its installation process in early June 1980 and in late July, after Gov. Reagan's nomination, both the RNC and the Reagan-Bush Committee were utilizing both packages, Heth said.

"Usually TCI sets its installation time for one package to be utilized by an organization at three months," Heth reported, "but in this case, the RNC and TCI were able to modify and install two packages for use by two organizations in two months. Remarkably," he added, "the system has yet to produce a major error."

The RNC utilized the software through terminals linked directly to the mainframe here, while the Reagan-Bush Committee used remote terminals and auxiliary printers placed in their offices in nearby Arlington, Va.

Check Processing

From late July to the end of the campaign accounting cycle in early December, the system produced approximately 200 checks per day, totalling around \$29 million, for the Reagan-Bush Committee, Heth said.

At the same time, it produced another 200 checks per day, totalling approximately \$30 million, for the RNC. The

system also produced daily accounts payable and general ledger reports, some containing as many as 2,000 pages.

"For all that processing, the system never output an incorrect check or an out-of-balance report," Heth claimed.

A major portion of the system's success may be attributed to the administrative guidelines and techniques provided by TCI. "These guidelines focus on the control and auditability of the data base, as well as on the ease of backup and recovery," he observed.

Based on the success of the two systems, the RNC now plans to purchase TCI's payroll package, according to Heth.

Lease, Software Prices Hiked on CDC Cybers

MINNEAPOLIS — Control Data Corp. will increase the lease price on its large-scale Cyber 700 series processors by 7% and hike the cost of major operating software and software maintenance for that line by 9.5%.

Lease prices for the Cyber 170 models 730, 740, 750 and 760 will go up 7% on March 1. Licenses for all Cyber 700 series network operating systems, selected compilers, languages and utility programs will rise 9.5% effective Feb. 1.

CDC's problem-solving support, the Central Enhancement and Maintenance Service (Cems), will also increase 9.5%, effective May 1.

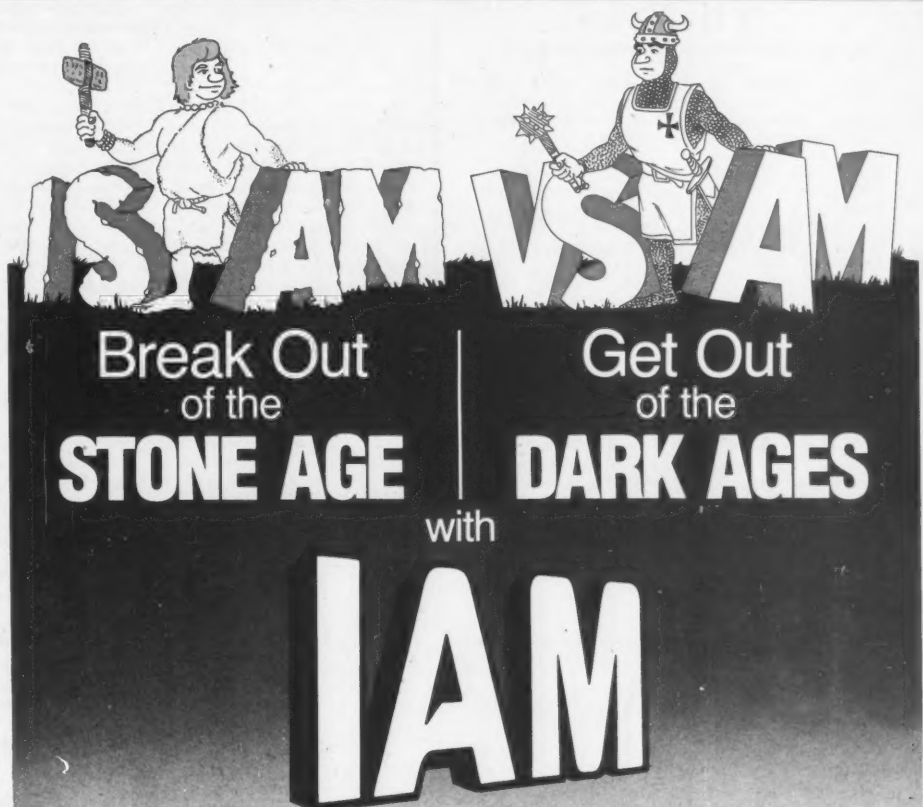
Selected peripheral equipment, including 885 disk subsystem, will go up

7% to 12% effective March 1, CDC said.

Spared from the price increase was CDC's entry-level Cyber 720 processor. Purchase prices on the 700 series were unchanged, and the purchase price for 700 series memory increments were decreased by 30%, a spokesman said.

The CDC price increases come on the heels of similar increases by IBM [CW, Jan. 12]. CDC's 700 series processors are roughly equivalent to IBM's 3033 line.

Industry analysts had predicted most major vendors would follow IBM's lead in raising prices. CDC's last price increase came in May 1980, and IBM made a similar announcement in June.



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Major Terms of Proposed Consent Decree

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — Based on comments from a number of knowledgeable sources, these are the major terms of the proposed consent decree to which Justice Department and AT&T lawyers have agreed:

- A new company would be established, encompassing the research, development and manufacture of "competitive" products and "enhanced" services — e.g., telephones, PBXs, intelligent terminals and computer-based on-line information offerings.

"Five or six" manufacturing plants, now owned and operated by Western Electric, plus about 15% of the Bell Laboratories work force, plus Teletype Corp., which manufactures AT&T's Dataspeed 40 terminal and similar devices, would be transferred to this new company.

However, it is not clear, according to our sources, whether the new entity would be independent of AT&T or merely a separated subsidiary. In the latter case, said Jack Biddle, president of the Computer & Communications Industry Association (CCIA),

"we would be very concerned."

- Enhanced services would be marketed through a separate subsidiary, basically according to the terms laid down in the Federal Communications Commission's (FCC) recent decision in the Second Computer Inquiry. A key element of this provision is that the "separate sub" could not own transmission or switching facilities. These would be provided by the subsidiary's parent, AT&T. The terms for the subsidiary would be the same as for its competitors.

- At least one, and possibly three, AT&T operating companies would be reorganized into totally independent companies.

Pacific Telephone and Telegraph Co. is one of the reported spin-offs, while Cincinnati Bell and Southern New England Telephone and Telegraph Co. are the others. Also, AT&T's present Long Lines Division would be converted into a separate subsidiary and might take over the long-distance plant now owned by Bell's 23 operating companies.

It is this last provision that has aroused the opposition of the specialized carriers. According to a spokesman, only divestiture of AT&T's entire Long Lines operation will adequately protect the specialized carriers against cross-subsidization and other anticompetitive behavior by Bell.

The spokesman added that the reported plan to spin off the three operating companies is "meaningless," since AT&T holds only a minority interest in two of them — Cincinnati Bell and Southern New England Tel — and has been tightly controlled in California by that state's public utilities commission.

'Conciliatory' Stance

CCIA, which has been one of AT&T's chief antagonists in Congress and at the FCC, appeared to be taking a significantly more conciliatory position last week.

"We're not opposed to a separate subsidiary for enhanced services if AT&T is required to spin off its terminal manufacturing and related R&D activities including software development," said CCIA President Jack Biddle. "The computer inquiry decision, in our opinion, should be able to prevent AT&T from cross-subsidizing the enhanced services of the separate sub with revenues derived from the operating companies."

"This statement assumes that the subsidiary obtains enhanced service from an operating company on the same terms as its independent competitors."

Biddle also indicated CCIA will no longer insist AT&T is barred by its 1956 consent decree from providing enhanced services such as electronic mail, which utilize central, computerized data bases, or offerings like Advanced Communications Service (ACS), which include software to interconnect different types and makes of dumb and smart terminals.

In the long battle at the FCC which preceded the commission's computer inquiry decision, CCIA argued that the 1956 decree bars such enhanced services because it requires Bell, with certain minor exceptions, to offer only regulated services.

The association's key point was that enhanced services are primarily data processing, rather than communications, and in any event would be offered, under the FCC decision, through an unregulated separate subsidiary.

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WASHINGTON, D.C. — Infotel '81, a two-day conference on telecommunications and how it is shaping competition within such industries as banking, publishing, advertising, retailing and broadcasting, will be held at the Mayflower Hotel here starting Thursday by Executive Enterprises, Inc.

Entitled "Conference on Information and Telecommunications Services: Business Strategies for the '80s," the Jan. 29-30 event will feature as speakers Anne P. Jones, a commissioner of the Federal Communications Commission (FCC); Walter Baer, director of policy programs for The Rand Corp.; Rep. Timothy E. Wirth (D-Colo.), a member of the House Subcommittee on Communications; and Richard E. Wiley, former chairman of the FCC and now a partner in the law firm of Kirland & Ellis.

The conference registration fee is \$525 per person and \$475 for each additional attendee from the same organization. Further information is available from Executive Enterprises, Inc., Ninth Floor, 33 W. 60 St., New York, N.Y. 10023.

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Who Will Be Stuck Holding Baby? Baby Bell Spawns Fear of AT&T Service Slump

By Brad Schultz
CW Staff

HOUSTON — AT&T's installed base of data communications users may face a decline in service quality from the telecommunications holding company should it give birth to a "Baby Bell" which would market DP products without regulation by the Federal Communications Commission (FCC).

That view was expressed by panelists at a recent Communication Networks '81 session here who questioned whether the FCC ruling that permits creation of an unregulated AT&T subsidiary in the DP marketplace will meet the commission's objectives of promoting competition among vendors and improving responsiveness to user needs.

The conference session did not necessarily reflect a consensus of present Bell customers, nor did the panelists claim that the long-term user impacts of the FCC ruling were obvious and inevitable, but the scenarios presented here pointed up issues likely to color plans for most of the nation's data communications in coming years.

FCC Provision

The problem with service to Bell's presently installed base lies with a provision of the FCC ruling that requires Ma Bell, the voice-oriented AT&T companies, to assume responsibility for supporting the equipment installed prior to March 1, 1982, when deregulation is supposed to take effect, according to attorney Frank Andrews III.

Conversely, the expected Baby Bell would service DP-related products installed after that date, the telecommunications lawyer for the Santa Fe, N.M., firm of Montgomery & Andrews explained.

With no new data communications business to build up, what incentive will Ma Bell have to uphold high standards of service to the installed user base? Andrews asked the conference session.

Deregulation of AT&T's DP side may be delayed for a year after the date specified by the FCC, Andrews continued, by various legal challenges and results of the federal antitrust suit against the telecommunications giant. That suit will apparently be resolved through a "negotiated settlement," or Consent Decree, but terms of the cease-fire could conflict with the FCC's specifications, which require a separate accounting mechanism for Baby Bell to prevent cross-subsidization from AT&T's lucrative voice side.

Concern Over PBX

Besides quality of service to the installed base, another issue raised by the prospect of a Baby Bell concerns AT&T's private branch exchanges (PBX), especially those known as supercontrollers, which consolidate control over the processing of words, voice and facsimile as well as data.

According to Andrews, Bell's Dimension PBX family may be construed as being enough on the DP side to fall outside FCC jurisdiction, where it could become much more expensive as part of Baby Bell's lineup — without controls the FCC normally exercises

on pricing by telecommunications carriers.

Why raise Dimension prices? AT&T may want to replace the Dimension family with the Antelope, a supercontroller Bell-watchers predict will appear in 1983 or 1984, Andrews asserted. AT&T has a tradition of driving up prices on old equipment, he explained, to force a user "rollover" to new equipment.

In pondering such matters, the user should also consider actions the FCC counterparts in state governments may take in the wake of the federal body's rulings and the Justice Department's prosecution, the New Mexico attorney added.

Rulings and court decisions at the federal level may wind up conflicting with actions at the state level, Andrews warned.

IBMS Impact

The session panelists also questioned the user impacts of AT&T's Installed Base Migration Strategy (IBMS), an internal policy outlined in several documents that pundits, playing on the policy's acronym, sometimes call "the IBM Strategy."

Regardless of whether IBMS was written with the largest DP supplier in mind, AT&T's migration strategy is designed to minimize losses incurred by Bell companies as they encountered competition in the data communications marketplace, Andrews said, and even to deter that competition.

According to IBMS guidelines promulgated on Nov. 1, 1979, the attorney stated, 80% of AT&T-installed PBXs that accept more than 100 communications lines should be "turned over" in three years — replaced by a new "flagship" product that could be the Antelope.

IBMS also advises Bell marketing personnel to turn over 60% of the installed PBXs that accept 40 to 100 lines; 40% of installed PBXs that accept 20 to 40 lines; and 30% of AT&T's Centrexes that feature between 1,000 and 2,000 user stations.

If Baby Bell engenders such a user rollover of integrated communications

'Satellite News' Plans Seminars In Washington

WASHINGTON, D.C. — Two seminars on satellite communications will be held at the Twin Bridges Marriott Hotel here this month by *Satellite News*.

"Economics and Regulation in the Satellite Industry," scheduled for Feb. 23, will be conducted by Dr. Wladimir Naleszkiewicz, vice-president of Satellite Systems Engineering, Inc.

"Programs and Marketing Opportunities in the Satellite Industry" will be given on Feb. 24 by Don W. Flora, division director of marketing for Comsat General Corp.

Registration costs \$195 per seminar or \$350 for both. Further information is available from Lee Euler, Phillips Publishing, Inc., Suite 1200N, 315 Wisconsin Ave., Washington, D.C. 20014.

controllers, the user should at least time its acquisition of existing Bell PBXs to occur at the rollover's outset — right now — rather than a few years from now when, Andrews maintained, the unregulated price structure could be substantially higher.

Another consequence of AT&T's deregulation may be significant increases on the tariffs for private lines — the network many organizations establish by leasing lines from Bell. This trend could price many users out of the private-line market, forcing them onto the AT&T switched network, Andrews observed.

Terrifying Birth

The user representative on the conference panel, Daniel R. Grove, said he found some aspects of Baby Bell's birth "absolutely terrifying." For one thing, Baby Bell may choose to stay out of sparsely populated areas, be-

cause the organization will be driven strictly by incentive for profit and may perceive little profit potential in rural America.

For the same reason, rival data communications suppliers may also shy away from rural areas, according to the manager of telecommunications for Motorola, Inc.'s operations in the western U.S.

Grove went on to echo Andrews' concern that Ma Bell, finding its data communications market frozen at the base installed prior to the enactment of deregulation, may neglect support for the installed base, choosing instead to emphasize a more dynamic clientele on the voice side.

"The future scares the hell out of me," Grove declared, adding that, in light of the various federal regulatory actions, "the future of telecommunications will have to get worse before it gets better."

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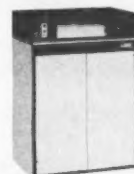
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Comnet Hears Pros, Cons of Dismantling Bell

By Phil Hirsch

CW Washington Bureau
HOUSTON — Whether to dismantle the Bell System or reorganize it was the subject of an extended discussion here at the recent Communication Networks '81 (Comnet) conference.

Divestiture of AT&T — conversion of its operating companies, Western Electric and Bell Laboratories into separately funded, independently owned and managed companies — is the only way to promote competition, according to C. Gus Grant, president of Southern Pacific Communica-

tions Co. (SPCC).

He pointed out that the 40 antitrust suits now pending against AT&T indicate the company cannot be trusted to compete fairly in the newly deregulated marketplace created by the Federal Communications Commission (FCC) Second Computer Inquiry decision.

However, William W. Betteridge, an AT&T assistant vice-president, insisted that Bell "accepts the need for a competitive environment." Technology, he added, is the driving force behind modern telecommunications and only

by not breaking up the Bell system can the full power of Bell's vast technological resources be fully exploited.

The separate subsidiary structure mandated by the computer inquiry decision will prevent the company from cross-subsidizing its unregulated offerings — such as terminals and computer-based on-line information services — with revenues earned from dial-up telephone and other monopoly services, Betteridge contended.

Meanwhile, this structure will allow AT&T to "apply the full range of our technology" to developing services. Through an integrated network, he added, these new services will be offered to all.

Bell Cream-Skimming

One of Betteridge's key points was that Bell's competitors, although they harp on the evils of cross-subsidization, ignore another evil — cream-skimming. He insisted that divestiture would restrict the geographic availability of

new products and services and raise their prices, thus denying the benefits to many of today's telecommunications users.

Rep. James M. Collins (R-Texas), the ranking Republican on the House Communications Subcommittee, indicated that Congress, after failing to enact a new communications act last year, will now seek guidance from the courts.

AT&T's competitors, including several from the computer industry, have asked for judicial review of the commission's computer inquiry decision — particularly the separate subsidiary provision and the conclusion that on-line information services are "incidental" to communications and thus can be offered by AT&T without violating the company's 1956 consent decree.

Meanwhile, trial of the Justice Department's antitrust suit against AT&T is now under way. At the heart of that case is the same question Congress wrestled with last year —

how to restructure AT&T to encourage competition while promoting technology and preserving present benefits.

Substantial Progress

FCC Commissioner Anne Jones was another speaker at the Comnet session on "Legislative and Policy Framework for Telecommunications in the 1980s." Responding to criticism of the Second Computer Inquiry decision, she admitted it does not provide a final solution to the structural problem but represents substantial progress toward that goal.

The reason: To optimize competition and preserve present service benefits, it is necessary to differentiate AT&T's monopoly services from those which can safely be regulated and left to marketplace control.

As Jones put it: "It is important that such a definitional structure draw a 'bright line' between basic and enhanced services, meaning that this distinction will be unambiguous and clear to all."

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PCS May Refile Against MTF

Software Theft Lawsuit Dismissed

By Marguerite Zientara

CW Staff

ATLANTA — A suite filed by Programmed Closing Systems, Inc. (PCS) against Minnesota Title Financial Corp. (MTF) charging theft of a software program [CW, Dec. 1] has been dismissed by agreement of both parties.

Because the suite was dismissed "without prejudice" — so that it may be refiled in the future — PCS' legal counsel is now attempting to gather more evidence relating to the case, according to attorney Mark Ellison of Fletcher Thompson & Associates here.

PCS, a small real estate- and mortgage-related software firm, filed the \$1.75 million suit on the grounds that MTF allegedly appropriated the software with the intent to disseminate it to "unauthorized persons" for its own profit.

The program in question is a fully automated loan processing secondary marketing, document preparation, title policy and binder preparation and loan servicing system.

"The court will take a look at some of the computer programs and possibly, hopefully, run some comparisons within the next 30 to 60 days," Ellison said.

"We just came to an agreement that we'd take a look at the two programs and run a comparison on them, hold everything in abeyance until we could find the proper experts to do that," he added.

PCS' request for an injunction to prevent MTF from

continuing to use the software was denied earlier this month, MTF attorney Norman Stone of Combs, Stone & Wright in Phoenix indicated.

MTF vs. PCS Pends

While the PCS vs. MTF suit is on hold, at least temporarily, a previously filed suit by MTF against PCS in the Arizona District of the U.S. Federal Court is still pending, Stone noted.

That suit, which PCS claims was filed in an effort to get the jump on PCS' suit against MTF, asked \$142,226 against allegations that PCS misrepresented the capabilities of its software.

According to MTF's suit against PCS, PCS' software

could not accommodate 20 terminals, did not have the load capacity as represented, "consistently malfunctioned often causing a shutdown of the system" and misrouted messages to improper terminals.

In addition, the suit claimed that because of PCS' software, current data was not properly stored, and simultaneous access of similar loan files by two separate terminals caused the system to stop operating.

PCS has filed general denials of those allegations. The next step in the legal process is expected to occur "probably within the next 30 days," according to MTF lawyer Stone. He could not specify what that action might be.

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Tenfold Productivity Hikes Reported Why Doesn't Everyone Use APL? Expert Asks

By Rita Shoor

CW Staff

TORONTO — Productivity increases by a factor of 10 have been claimed for APL by some software vendors, according to Robert Metzger, branch technical manager at the U.S. headquarters of I.P. Sharp Associates, Inc.

If these claims are true, why isn't everyone using APL?

Metzger provided some answers for attendees at the 1980 APL Users Meeting here with a paper entitled "Making APL Programmers More Productive."

One reason that people don't use APL is simple historical inertia, he maintained. "People will do tomorrow what they did today because that's what they did yesterday."

Another reason "rarely ad-

mitted" is that APL programmers themselves are often not as productive as they could be, he said. This is due to a variety of pitfalls including inadequate training, isolation from other APL programmers, inefficient implementations, incorrect methods, lack of programming standards and inadequate tools.

Amateur Users

A large number of APL users are amateur rather than professional programmers, Metzger explained. They write programs for themselves rather than for other people and this leads to what he called the "fallacy of the five-day class."

This teaches that since a person without any computer background can be taught to

write APL programs in one week, that same person can "analyze, design and build applications for others with no further training."

"It's just not true," he said, cautioning that the fact that APL is easy to use does not negate the need for training.

APL users' isolation comes because they are often the only people in the department who write programs, Metzger said.

He recommended providing a budget for computer-related publications and attendance at advanced training courses and APL conferences as ways to avoid the problems for the user in APL Siberia.

Inefficient APL implementations are those which make it possible to generate a defined function that is faster to write than an APL primitive, yet produces the same results. Vendors who market this type of implementation "force people to write programs in unreasonable ways to get reasonable performance."

Faced with such an implementation, the APL user should either pressure the vendor into correcting the situation or find another vendor, according to Metzger's paper.

Surprisingly, Metzger continued, incorrect APL programming methods are a direct result of a programmer's previous experience with other languages.

Languages such as Fortran, Cobol, PL/I and Algol are scalar-oriented and allow only a single piece of data to be processed at a time. This orientation makes explicit looping both a "necessary and effective" technique, he said.

In contrast, APL is array-oriented and current imple-

mentations are interpreted rather than compiled. This makes explicit looping expensive and the end result is programs that can require more time to write as well as taking more time to run.

"APL applications require APL methods," according to Metzger.

Best Raw Material Needs Best Tools

TORONTO — "APL is the finest raw material" for building application systems, Robert Metzger informed attendees at the 1980 APL Users Meeting here.

However, APL users need the finest available software tools to manipulate that raw material if they hope to make programming productivity increases a reality in their organizations, he warned.

Metzger, a technical branch manager from Rochester, N.Y., office of I.P. Sharp Associates, Inc., divided the programming tool into categories described as "internal and external."

Idioms, pseudo-primitives, building blocks and templates are internal in that they become part of the final product, he explained. Generators, utensils and documentors are external because they do not become part of the target system and, in the case of documentors, don't usually produce APL code.

"Mastery of a standard set of APL idioms is essential to productive APL programming," Metzger claimed. Working with these idioms is comparable to a person learning a natural language who begins by "processing one letter at a time," but soon moves up to syllables, words and phrases. The most productive APL programmers write whole lines of code at once and each line contains one or more idioms, he said.

Pseudo-primitives are the next level up from idioms in the APL semantic structure, according to Metzger. They are defined functions that normally take more than one statement to implement and

are either variants of existing APL primitives or functions that are complementary to the primitives. Common pseudo-primitives include the string search, string replace and join array, he said.

Building blocks differ from pseudo-primitives in that the input sources and output targets are not rectangular arrays, he continued. They normally take arguments and return results that are usually control information rather than data requiring transformation.

Often incorporated into application packages, building blocks include interactive input, terminal control, output formatting, file handling, data base management and data conversion from non-APL sources.

Template Code

"Templates," as used by Metzger, do not refer to the plastic forms so familiar to any programmer who has drawn his own flowcharts. Instead, he defined a template as general code which is altered or augmented to fit a specific situation. Its chief advantage is that it is already debugged and can be custom-tailored to fit organizational needs, he explained.

APL generators are related to macro processors available for PL/I and some assemblers but are "more powerful because the full APL language is available," according to Metzger. If an installation makes frequent use of similar file structures for different applications, a generator that creates the necessary file cover functions might be a worthwhile tool.

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CDC Offers Rival to IBM 3380 Disk System

By Tim Scannell
CW Staff

MINNEAPOLIS — Control Data Corp. today introduced its head-to-head competitor with IBM's 3380 disk system, bringing to three the number of plug-compatible alternatives to the IBM product.

CDC's 33800 storage unit and 38800 controller are priced about 15% less than IBM's offerings and reportedly feature an enhanced dual-access option that allows each actuator of a disk storage unit to be addressed through two internal data paths. With the CDC option, two concurrent data transfers can occur using any two actuators in a storage string.

The dual-access feature usually comes into play in the event of a channel, controller or storage director malfunction to ensure continued data availability, but can also be helpful to alleviate bottlenecks in high I/O environments, a CDC spokesman explained.

Two Pathways

A dual-access-type feature is available on IBM's 3380, called dynamic path select, and on the plug-compatible alternatives offered by Memorex Corp. and Storage Technology Corp. But, CDC's unit is the only device to offer two data pathways for each actuator in a storage string, the spokesman claimed.

Like IBM's 3380, introduced last June, CDC's storage unit incorporates

Workshops Scheduled On Long-Range Plans

ROCKVILLE, Md. — Five-day workshops on "How to Develop an Effective Long-Range Data Processing Plan" will be offered in five U.S. cities and in London by Keston Associates.

The workshops will be conducted Feb. 2-6 in Ft. Lauderdale, Fla.; March 23-27, Washington, D.C.; April 20-24, San Francisco; June 1-5, London; and Aug. 17-21 in the Outer Banks of North Carolina.

The cost of attending a U.S. workshop is \$795 per person; the London workshop costs \$1,000. Keston Associates is at 11317 Old Club Road, Rockville, Md. 20852.

thin-film head data recording technology, which allows the device to read and write data at a rate of 3M char./sec. The CDC version can also store up to 630M bytes per actuator, 2.52G bytes per storage unit and 10.08G bytes per storage string (which is a collection of 16 actuators).

However, each of the controllers' two independent control paths, called storage directors, can handle up to 16 actuators, allowing for an ultimate data capacity of up to 20.16G bytes, the spokesman said.

Unlike IBM's 3380, the 38800 has a built-in processor that handles remote diagnostics. The CDC processor can be hooked up to the user's telephone to check out the unit from any of the firm's remote field maintenance of-

fices, CDC said. Presently, user's of IBM's device have to attach a "black box" type of diagnostic processor that is acquired separately from the storage unit.

Other features of the 33800 include count-key-data functions that are said to provide format continuity; rotational position sensing, which permits the channel and storage director to disconnect during periods of rotational latency for improved system performance; and a format write release feature that enables the channel and storage director to disconnect while the remainder of a track is being erased.

First customer shipments of the CDC 33800 are scheduled to be made in the second quarter of 1982, while the 38800 controller will be shipped dur-

ing the second quarter of this year. By comparison, the IBM 3380 shipments are scheduled to begin sometime within the next few months. However, for a new customer, the wait for a 3380 storage system may be more than two years, the CDC spokesman claimed.

CDC's 33800s cost from \$66,000 to \$120,000, depending on the configuration. Lease prices range from \$1,200/mo to \$2,200/mo. Maintenance on the storage device costs from \$240/mo to \$470/mo.

The 38800 control unit sells for \$51,960 with monthly lease and maintenance prices of \$1,299 and \$176, respectively.

Additional information is available from the firm through Box O, Minneapolis, Minn. 55440.

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In Federal DP Management Panel Calls GSA More Obstacle Than Help

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Confirming the complaints of many federal agencies and government DP contractors, a panel studying the General Services Administration (GSA) recently reported the agency's efforts to provide governmentwide DP management functions are more an obstacle than a help.

"Assessments of the GSA performance in the ADP area," said the study group established by the National Academy of Public Administration (Napa), "indicate major deficiencies and continuing dissatisfaction with GSA performance."

Recommendations for improving the branch that oversees federal DP and telecommunications procurements, the Automated Data and Telecommunications Service (ADTS), were part of the panel's overall suggestions for improving operations.

The Napa report called for a number of administrative and legislative initiatives to upgrade the administration's functions. One option put forward was to set up the agency as a government corporation under a chief executive officer and board of directors appointed by the President.

Whether the agency is made into a corporation or just more efficiently

structured, there are a number of long-standing problems that must be corrected, the report said. Napa noted as particular problems the GSA's cloudy and constantly changing mandate and the rapid turnover in executive positions.

The agency has had seven administrators in the last 10 years. In addition, the panel said, there have been turnover problems in high-level ADTS offices.

While the report approved of many of the changes that have been made by ADTS Commissioner Frank Carr, the Napa panel listed the following several criticisms of that group's operations.

- "There is no central office with responsibility for long-range planning for ADP acquisition and utilization. This is a particularly important omission in an area involving rapid technological change," the report said. "There has been a continuing lack of centralized policy direction and planning coordination."

- "Little effort has been devoted to assessing the technological change that has already occurred, much less to anticipating future changes and the potential of such changes for government management."

- Because DP and telecommunications management are carried out as separate functions, "Little consideration has been given to the emerging technological merger of these two fields," according to Napa.

- "ADTS has not developed the requisite individual and institutional capacities to adequately perform the roles and functions envisioned for it." GSA's difficulties in attracting and keeping qualified personnel are magnified in ADTS, whose highly skilled DP professionals can obtain better paying jobs in the private sector or elsewhere in government, the report said.

- "Frequently the computers used in GSA operations are old and technologically obsolescent." The agency's reliance on outdated equipment and software "has caused many user agencies to be skeptical of the capability of ADTS to help them with their own needs," the report added.

- "ADTS relations with customer agencies have been characterized by conflict and frustration." The report termed this "a natural condition" given the service's control over the DP operations of other agencies and departments. "However," the panel said, "the natural tension . . . is aggravated by the perception of many user agencies that ADTS lacks the technical competence to be of genuine assistance."

- The most common complaint of user agencies is the time it takes — anywhere from two to five years — to get approval for procurements. This results, the panel said, in the acquisition of equipment that is obsolete or nearly obsolete.

The study group also decried the "paternalistic control" over ADTS functions exercised by the House Government Operations Committee. The committee has virtual veto power over all large DP and telecommunications procurements.

"It is apparent that ADTS needs less intervention by Congress and especially the House Government Operations Committee," the report said.

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Commerce Makes Appeal Businesses Urged to Adopt OECD Privacy Guidelines

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The U.S. Commerce Department is making a direct appeal to U.S. corporations to publicly adopt personal data privacy guidelines recently completed by the Paris-based Organization for Economic Cooperation and Development (OECD).

In a letter to 750 U.S. business leaders, the department recommended adoption of the guidelines as the best way to assure unimpeded transborder flows of automated personal data.

The guidelines, approved late last year by the U.S. and its OECD partners, recommend basic principles of personal data protection and urge nations to "endeavor to remove or avoid creating, in the name of privacy protection, unjustified obstacles to transborder personal data" [CW, Nov. 3].

The guidelines document sets standards for data gathering and handling and calls for "appropriate security measures" against accidental or unauthorized destruction, loss, access, alteration or dissemination.

OECD Rights

The document also recognizes the right of OECD members to demand stricter data protection measures than recommended in the guidelines' minimal standards. To forestall data flow restrictions unpalatable to U.S. multinational firms, the U.S. govern-

ment is urging American corporations to publicly implement the guidelines.

Under the terms of the guidelines, OECD members would be justified in restricting data flows to countries that do not substantially observe the principles set forth. Because the U.S. does not have privacy laws corresponding to those of many industrialized nations, particularly in Europe, the Commerce Department is recommending compliance as the best bet for maintaining unimpeded data movement.

Besides the mailing to U.S. businesses, the Commerce Department, with the support of ex-Secretary of State Edmund Muskie, had tried to set up a meeting between Carter Administration Commerce Secretary Philip Klutznick and 25 corporate executives, to urge the businessmen to sell the guidelines to U.S. firms and associations.

In a Dec. 22 letter to Klutznick, Muskie said "I believe that American businesses and trade associations will understand that it is in their own interest to gain international acceptance of the principles of the guidelines. Without such acceptance, other nations may raise barriers that would impede the flow of personal data and other commercial data communications."

The meeting was called off because there was not enough time left in the Carter Administration to set it up, but the effort will be pushed in the new Administration, according to a Commerce official.

The department is urging that businesses go as far as possible to implement the guidelines in their daily operations because there have been no public statements from European nations about their effect in tempering privacy legislation and data protectionism efforts, according to William Fishman, a senior policy advisor in Commerce's National Telecommunications and Information Administration.

But, Fishman said, "in the course of negotiating the guidelines and in many discussions outside the negotiation process," U.S. representatives found their European counterparts "regard the guidelines and voluntary compliance in the U.S. as a very important advance."

Too Early to Tell

Fishman was careful to point out that European data protection authorities are only beginning to set policies for data protection. It is too early, he said, to gauge the guidelines' effectiveness in staving off data flow restrictions. For that reason, he said, U.S. firms should do all they can now to publicly embrace and implement the guidelines.

While some companies may believe a simple statement endorsing the guidelines may be sufficient, Fishman speculated that "might get them in the front door, but that doesn't get them the data. Because the Europeans are going to say 'All right, you've agreed to it, now tell us how you're going to implement it.'"

Asked how companies should implement the guidelines, Fishman said the U.S. government is being "very cautious not to tell industry how to do this."

"That's not our role and I really wouldn't know what to tell them."

Printout Replaces Green Thumb

MINNEAPOLIS — A computer printout rather than a green thumb could help your garden grow this year.

For \$3.50, seed producer Northrup King will provide a printout showing a home gardener what can be planted, where it can be planted, the best time of year and the space each plant needs. The gardener simply fills out a vegetable variety selection, stating how many people the garden should feed and with what fresh or canned produce.

Using Zip Codes, the computer determines the best planting times and amount of greens that should be raised, based on soil types. The printout for a 20-ft by 30-ft garden can be over 6 ft long.

The garden plan is one of more than 100 programs developed at Purdue University by horticulturist John Wott using the Fast Agricultural Communications Terminal (Facts). The Facts system, set up in 1977 under a grant from the W.K. Kellogg Foundation, uses a Digital Equipment Corp. PDP-11/03 processor and memory, a Decscope VT52 CRT terminal and a DEC LA-180 printer.

Facts was developed to place intelligent terminals in each of the 92 Indiana county extension offices. Currently, a tie-up to the Control Data Corp. 6500 system at Purdue is available.

The printout is available for all 50 states. Would-be gardeners can obtain the "Smarter Garden Plan" form by writing Northrup King Co., Consumer Products Division, Box 1615, Minneapolis, Minn. 55440.

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Insurance Firms Found Voluntarily Cleaning Up Possible Privacy Abuses

URBANA, Ill. — The insurance industry is cleaning up possible privacy abuses voluntarily, according to a recent survey conducted by the University of Illinois Survey Research Laboratory.

The survey was conducted for Prof. David F. Linowes, former chairman of the U.S. Privacy Protection Commission and Boeschstein professor of political economy and public policy at the university. The survey results were based on responses from 19 of 91 large insurance and property and casualty companies. Many of the questions were based on abuses uncovered by the privacy commission between 1975 and 1977.

Although no legislative action has been taken since 1977, when the U.S. Privacy Protection Study Commission called for changes in the recordkeeping habits of the insurance industry, some of the commission's recommendations have been voluntarily adopted, the survey found.

'Search Warrant'

One area of concern for the privacy commission was the authorization form signed by individuals when applying for insurance. One insurance executive called it "a search warrant without due process," according to Linowes.

The form contained no expiration date and allowed the persons it authorized to obtain any kind of data from anyone, as opposed to the medical data from physicians and hospitals to which it was meant to be restricted, the professor claimed.

The survey showed three out of every five companies that obtain written authorizations now include an expiration date and 67% indicate the specific party from whom information is sought. Slightly more (75%) indicate the nature of the information being sought while 95% listed the specific purposes for which the institutions may use the information.

The research group found that four of five (82%) insurance institutions currently have a policy for conducting periodic evaluations of their record-keeping systems, and that within the last two years, nine of 10 (87%) have conducted evaluations pertaining to confidentiality safeguards.

While action has been taken on many privacy levels, the survey revealed that some areas lag behind.

While only one of 16 (6%) companies requires information on arrest records, more than one-half (56%) of those responding require information on convictions of individuals, and three of five (62%) institutions collecting information concerning convictions update this information at certain intervals.

The survey found that disclosure policies among the companies vary depending on who is to receive the information.

Three of the five respondents always obtain authorization of the individuals before disclosing information about them to third parties, but the situation changes when dealing with government agencies. According to the survey results, nearly one-half (47%) of

the companies disclose information about individuals to government agencies other than those required by law. Three of four (73%) institutions require subpoenas for such disclosures.

In addition, less than one-half (44%) of the companies inform individuals of their routine disclosure practices to governmental inquiries, while more than one-half (56%) inform individuals of the routine disclosure policies to nongovernmental inquirers. Three out of four companies also limit the type of information released to nongovernmental inquirers.

Regarding the collection of personal data, one-half (50%) still seek information from third parties without written permission. When permission is obtained, more than two-thirds of the firms indicate to the individual the specific third party from whom information is being sought (67%), the specific nature of the information being sought (75%) and the specific purpose for which the information might be used (94%).

Nine of 10 (89%) companies have established executive-level personnel to maintain privacy safeguards, and none of the companies use polygraph tests or other devices to verify information about an individual.

Nine of 10 (88%) institutions check, verify or supplement background information collected directly from individuals, as well as notify the individuals about the background check before such information is collected (93%). All the firms allow the person involved to correct this information, the survey showed.

Three of four (74%) insurance companies use investigative firms to collect or verify information on current or potential policyholders. Most of the firms review the operating policies of these investigators, and all allow the individuals some input into the investigative report.

One of five (19%) insurance companies report medical information obtained from nonmedical sources to other insurance institutions, while seven of 10 (71%) disclose information of previously unknown medical problems to an individual's doctor.

Unknown Safeguards

Although the companies have instituted safeguards, they have failed to let people know about them, the survey indicated.

Less than one-half (47%) of the institutions have a policy to inform individuals of the kinds of records they keep concerning them, while slightly more than one-half (53%) inform individuals of the use of these records within the company. Three of five (59%) companies tell individuals to which records they have access.

Five of six (84%) companies inform individuals of the specific reasons for an adverse decision, but only three of five (61%) institutions inform individuals of the specific information which supports these reasons, the survey found. All the companies inform their policy applicants of their rights under current law.

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Union Accepts 28% Raise Agreement on Pay Hike Ends Lockheed Strike

By Jeffrey Beeler

CW West Coast Bureau

BURBANK, Calif. — Nearly 1,700 striking Lockheed Corp. employees, including an undisclosed number of computing personnel, earlier this month resolved a longstanding salary dispute with the company's manage-

ment and returned to their jobs for the first time in almost two months.

The work stoppage ended Jan. 14 shortly after members of a labor union at Lockheed's California Co. voted to accept the firm's proposal for a more than 28% pay hike to be phased in during the next three years.

The strike was staged by members of Lockheed's Engineers and Scientists Guild (ESG), which serves as the bargaining unit for roughly 2,800 employees representing some 280 job categories.

Computer Positions

An estimated 20% of the union's approximately 1,600 dues-paying members hold computer-related positions ranging from programmer to systems analyst to operations specialist, according to ESG president Richard Cappelletti.

The computer-related portion of the union's membership embraces 24 job classifications and works exclusively on the scientific side of Lockheed's systems operations. A different union represents the company's business-computing personnel, who were apparently unaffected by the ESG-called job action.

Altogether, more than 1,680 members of the ESG's total bargaining unit participated in the just-ended work stoppage, which is believed to be the first in Lockheed's history to involve employees in the firm's scientific computing department, Cappelletti said.

Heart of Problem

The strike began last Nov. 17 when union and company representatives reached an impasse in their negotiations over a new three-year employ-

ment contract.

At the heart of the problem was a dispute over the size of the union members' salary increases. The ESG's rank and file demanded a raise in their cost-of-living allowance as well as a base-pay hike to enable them to maintain parity with the company's hourly workers, who had recently received a hefty boost in wages.

Lockheed's response to the proposed salary increases fell substantially short of the union's demands, and the first in a long series of contract negotiations quickly ensued. But when two months of almost steady labor-management haggling had still failed to produce an accord, the union's membership decided to press its case and walked off the job.

Among the strikers were an undetermined percentage of Lockheed's scientific computing personnel, some of whom belong to the ESG and some of whom do not.

Lockheed's status as an open-shop organization reportedly gives its employees the option of joining a union or remaining independent.

Since last November's abrupt breakdown of contract negotiations, union and management representatives have resolved their salary differences and forged a new three-year employment agreement that grants ESG members yearly pay hikes totaling 11.25%, 9% and 8%, Cappelletti said.

Executives' Conference This Week To Explore 'New Information Era'

NEW YORK — A two-day *Business Week* Executive Conference on "Leadership in the New Information Era" will be held Wednesday and Thursday at the Waldorf Astoria here.

Developed for chief executive officers, corporation presidents, corporate planners, productivity executives, MIS managers and other senior managers, the conference will offer an opportunity for "executives from leading-edge corporations [to] address your fears, answer your questions and enlarge your understanding of information systems," its organizers said.

Keynote presentations will be made by author Isaac Asimov; John Diebold, chairman of the Diebold Group, Inc.; and Joel A. Fadem, a senior research fellow at the University of California at Berkeley's Institute of

Industrial Relations.

Speakers at the conference will address "How Will the Corporate Structure Change?" "Instituting an Information System: The Costs, the Lessons, the Payoffs," "Maximizing and Streamlining Strategic Planning," "How to Start Today to Build the Automated Office" and "The New Technology and the Work Force."

Other topics will include "Playing It Safe: Privacy and Security Issues," "The Bottom Line," "The Colliding Sectors of Information Technology," and "Applying the New Technology."

Attendance costs \$750. Further information is available by writing *Business Week* Executive Programs, c/o McGraw-Hill Conference & Exposition Center, Room 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

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The question then becomes what is right for your environment. Again, STC is ready to help you find the answer. And since we offer the best of both, we won't promote one at the expense of the other.

Here are some of the basics.

Memory vs. Page Store: fitting the tool to the problem.

By adding main memory with STC's 3700 Universal Memory System, you will experience an immediate improvement in both throughput and terminal response time. This is true because as your real-to-virtual storage ratio increases, paging activity declines, with a consequent reduction

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Over-initiation is a case in point. As you add batch jobs or log-on more TSO or CMS users, the increased job load will eventually result in page thrashing and resource conflict. That threshold can be reached long before your CPU is 100% busy.

As illustrated in the graph, a high-speed paging device, such as STC's 4305 Solid State Disk, will dramatically broaden your system's performance range by decreasing its sensitivity to over-initiation. Faster page response time raises your paging threshold while dedicated paging storage reduces contention on your disk subsystems.

A configuration for your system.

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prepared to help you discover the combination of paging store and memory that fits your cost, performance, and productivity objectives.

Our 4305 Solid State Disk is available in a range of configurations to fit your Amdahl, IBM or other compatible processor. With 0.3 msec. access times, capacities to 45 Mbytes, and transfer rates to 6.0 Mbytes per second, it's the perfect solution to your paging problems.

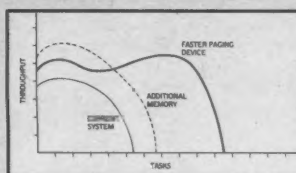
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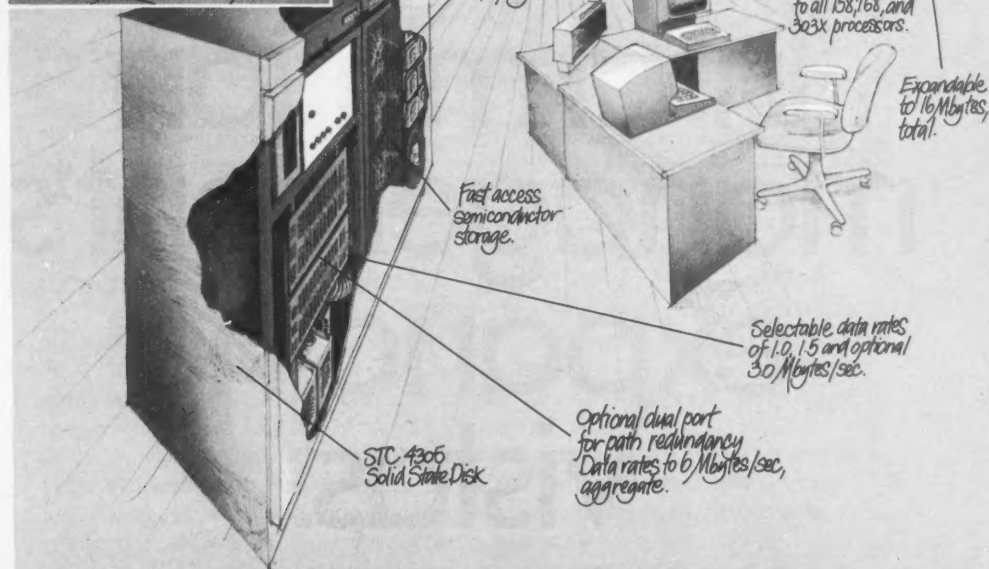
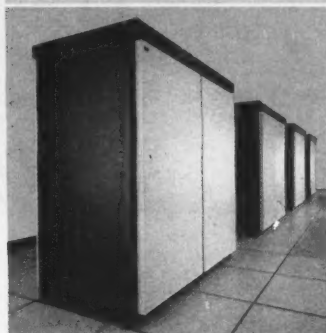
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Papers on Software Technology Needed for Maryland Symposium

WASHINGTON, D.C. — The National Bureau of Standards (NBS) is soliciting papers to be presented at the "Trends and Applications 1981: Advances in Software Technology" symposium.

The symposium, to be held in Gaithersburg, Md., May 28, will be cosponsored by the NBS Institute for Computer Sciences and Technology, the

Washington D.C. Chapter of the Institute of Electrical and Electronics Engineers (IEEE) Computer Society and the IEEE Washington Section.

The program committee said it is interested in papers of a tutorial nature and those which present new research in areas including: software engineering, software quality control, distributing process-

ing, computer communications, data base software, programming and operating systems, secure software, performance evaluation and novel applications.

Authors should submit three copies of a 1,000-word abstract by Jan. 30 to F. Terry Baker, Program Chairman, IBM-FSD, 10215 Fernwood Road, Bethesda, Md. 20014.

'Activity Approach'

SAN JOSE, Calif. — "Project Management for On-Line Interactive Manufacturing Systems" is a four-day class that reportedly will use special techniques to help teach project managers how to communicate better with their colleagues.

Organized by Scott-Kennard & Associates, Inc., the agenda includes seminars and workshops on project planning, evaluation and management. The teaching technique, devised by Scott-Kennard, is called Activity Approach.

The class is offered Jan. 26-28 at the Hyatt San Jose; it costs \$985 and will be limited to 30 people. More information is available from Scott-Kennard & Associates, Inc., P.O. Box 23839, San Jose, Calif. 95153.

Automated Office Seen Beset With Problems

By Robert Glass

Special to CW

SEATTLE, Wash. — Office procedures are subject to two problems:

- The basic information flow is simple, but there is an immense exception handling process.
- The procedures evolve constantly.

These problems were cited by Clarence A. Ellis, office automation researcher, of the Xerox Corp., Palo Alto Research Center (Parc), at a recent University of Washington Computer Science Colloquium here.

Ellis discussed the efforts of Parc's Office Research Group to understand and research the automation of offices. The group has produced a system called "Officetalk," which is based on the electronic desktop concept — a video screen is used to simulate the top of a typical office desk, even to stacking and unstacking reference materials, and complete with clutter!

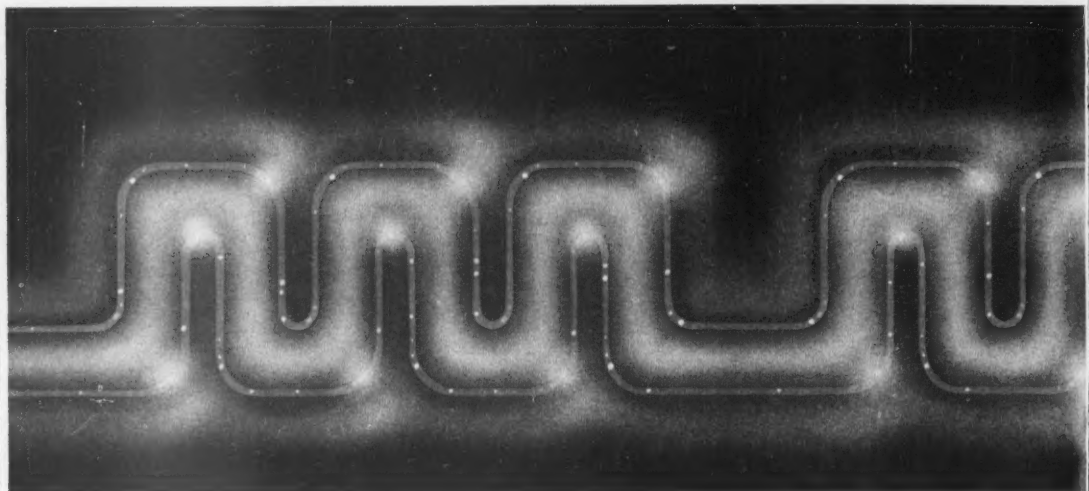
Officetalk also uses the concept of "intelligent forms" — paperwork in electronic form which knows its own attributes, such as destination; turns "red" as its processing deadline is approached; and gets "angry" when it is bottlenecked, reporting its status to management.

Research problem areas exposed by the research and needing further study, according to Ellis, are:

- Programming languages for naive users.
- Distributed operating systems.
- Artificial intelligence.
- Database design (e.g. personalized data bases with idiosyncratic access).
- Social implications.

Parc is seeking the assistance of academic computer science programs in these areas.

Officetalk has been used experimentally in some actual office situations, with mixed results. In one situation, an office worker took the researchers aside and said "If our supervisor weren't here, we'd really tell you how the office runs."



Information management's expanding vistas.

Between Parts of Texas, Louisiana

Interstate Link Speeds Unemployment Claims

By Ann Dooley
CW Staff

HOUSTON — Unemployed workers in parts of Texas and Louisiana are receiving speedy unemployment compensation through a first-of-its-kind computer link between the two states.

Unemployed workers living in one state who file for benefits they have coming from the

other state, previously had to wait as long as three weeks to receive an interstate unemployment claim.

With the computer system in operation, turnaround time is an average of 10 days, officials from the two states said.

Developed voluntarily by Texas and Louisiana as a two-year pilot project, the network is viewed by planners as the

first step toward someday building a similar system to speed interstate claims handling to all 50 states.

The two-state hookup encompasses 67 unemployment claims offices in Louisiana and 26 in southeast Texas. Separate IBM 370/158 systems in each state provide stored data on that state's unemployment benefit files.

The link was accomplished smoothly because of the compatibility of the two state's systems, officials said.

Immediate access to the unemployment data allows claims representatives to quickly predetermine an individual's eligibility for unemployment insurance as well as the amount due.

Until now, there was no way

to predetermine a claim. Instead, a form was filled out and sent to the respective state for processing and eventual payment; a method that frequently created a heavy work load and a payment backlog.

With the interstate link, when a person applies for a claim from a neighboring state, a claims representative calls up the unemployment files on a CRT terminal to determine the eligibility and the amount of compensation due.

Once the necessary information is found, it is mailed to the neighboring state where it can be processed without delay. In the future, claim information will be sent directly over the network, further speeding the payment process, according to officials.

TTI to Stress Office Systems In Spring Series

LOS ANGELES — The Technology Transfer Institute (TTI) spring seminar series this year will emphasize technology in the office environment.

Two five-day sessions led by James Martin will begin with a session on "Senior Management" for nontechnical managers and continue with a four-day seminar on "Productivity Through the New DP Revolution." These are offered April 6-10 in Las Vegas and April 13-17 in New York.

Three seminars will be held April 13-17: in Washington, D.C., on software engineering, in Los Angeles on "X.25 and Other Packet Switching Protocols" and in Boston on "Capacity Planning."

TTI has organized two more sessions slated for April 22-24. One in San Francisco will discuss "Satellite Data Networks" and the other, in New York, will consider "The Office of Tomorrow."

Registration information is available from TTI through P.O. Box 49765, Los Angeles, Calif. 90049.

Consultants/Experts Wanted

Consultants and/or experts whose expertise is in the EDP, data communications, or office systems areas are invited to submit their outlines for nationally held seminars of 2 or 3 days' duration, conducted approximately 15 times or more a year. Must be able to communicate with experienced personnel in their field. Unique opportunity for recognition and compensation with distinguished industry sponsor. For consideration, please send an outline of each seminar you can teach plus a copy of your biography.

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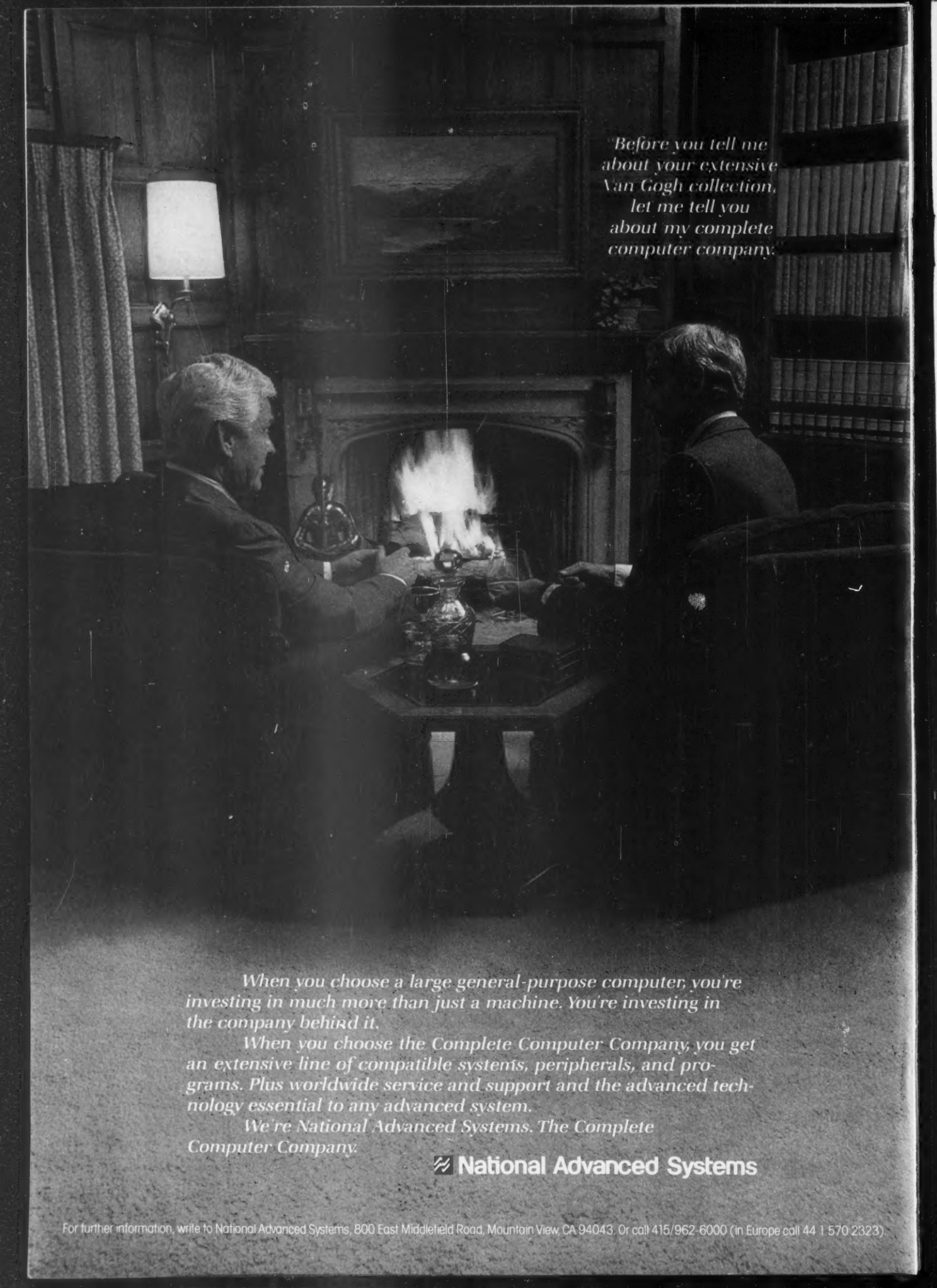
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DPMA Workshops Slated On Interpersonal Skills

DALLAS — The Data Processing Management Association (DPMA) will sponsor a series of one-day workshops designed to improve the communication and interpersonal skills of all levels of DP personnel.

Titled "Influencing Persuasively," the workshops will be held in seven U.S. cities in February and March.

The objective of the workshops is to increase the DP professional's ability to gain user commitment and action, according to Donald E. Price, DPMA president.

Price said other objectives are to get DP professionals to recognize and use their influencing strengths, communicate effectively without technical jargon, listen actively, increase productivity and make more effective decisions through improved communications.

The workshops will make use of a wide range of instructional media, with a heavy accent on group and class participation, according to DPMA spokesman Vincent Caracio.

Iverson to Speak On APL Uses At ACM Course

WASHINGTON, D.C. — Dr. Kenneth Iverson has been invited by the Washington, D.C., Chapter of the Association of Computing Machinery (ACM) to be the international speaker at a seminar scheduled to take place at the University of Maryland Feb. 26.

Iverson will discuss the problems of managing the development and use of APL applications and the provision of APL services.

A member of the National Academy of Engineering, Iverson received the American Federation of Information Processing Societies' and Harry Goode Memorial Award in 1971 and the ACM Turing Award in 1979. He has authored three texts: *A Programming Language* (1962), *Algebra: An Algorithmic Treatment* (1972) and *Elementary Analysis* (1976).

Registration fees for the seminar vary. Further details are available from ACM headquarters, Professional Development Committee, P.O. Box 39110, Washington, D.C. 20016.

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"We'll use films, video tapes, some lectures and lots of small workshops, but will in general be very participation-oriented," Caracio said. "You don't learn communications just by listening to others."

The per-participant cost is \$150, with a \$25 discount available to DPMA members. The dates and sites of the workshops are: Dallas, Feb. 19; Houston, Feb. 24; Atlanta, March 10; Washington, D.C., March 12; Seattle, March 24; San Francisco, March 25; and Los Angeles, March 27.

For more information, contact Vincent Caracio, DPMA Education Foundation, Dept. THC, Suite 710, 7616 LBJ Freeway, Dallas, Texas 75251.

Program Offers Women Two-Year Computer Degree

BOSTON — Women interested in technical careers can enroll in a special graduate program that will enable them to obtain a computer science or engineering graduate degree in two years.

Boston University's Late Entry Accelerated Program (Leap) is open to 30 women beginning in May.

Applications now are being accepted for the program designed to train women with bachelor's degrees in physics, chemistry, mathematics or engineering, for careers in computer science or engineering. The program is specifically aimed at women who graduated from college before 1979 and have been out of

the workforce or in other fields.

Supported in part by the National Science Foundation, Leap will begin with a week's orientation and a core course to introduce participants to computer science and engineering.

There will be preparatory courses in mathematics, physics or engineering. The group will complete the preparatory segment of the program in August 1982 and then divide along elective pathways and earn a nine-month master's degree.

More information is available from Sonia Parker, Boston University, College of Engineering, 110 Cummings St., Boston, Mass. 02215.

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DATA COMMUNICATIONS

	Course #	Dates
CICS/VS Command-level Applications Programming	CV-22	Feb 2-6
• Develop and maintain CICS/VS command-level application programs • Determine trade-offs for best use of various CICS/VS facilities • Make use of basic input/output facilities of BMS as they relate to the IBM 3270IDS or 3270 compatible terminals	CV-23	Feb 9-13
	CV-24	Feb 23-27
CICS/VS Macro-level Applications Programming	CM-02	Send for schedule
CICS/VS Testing & Debugging	CT-11	Send for schedule
CICS/VS Design	CD-13	Send for schedule

ACCESS METHODS

VSAM Using Access Method Services (AMS)	VA-31	Feb 2-6
• VSAM Overview • VSAM Control Blocks • File Design • VSAM Considerations within CICS • Optimizing VSAM • Alternate index • Shared resources • Recovery		
VSAM COBOL Coding for VSAM	VC-34	Feb 9-11
• Load, read, extend, update key-sequenced file • Load, read, extend, update entry-sequenced file • Processing via an alternate index (OS/VS)	VC-35	Feb 18-20

DATA BASE TECHNOLOGY

IMS/VS Applications Programming DB	MB-14	Feb 2-4
• Identify major functions of DL1 • Coding DL1 calls to retrieve, add, or delete data • Build segment search arguments	MB-15	Feb 18-20
IMS/VS Applications Programming DC	MC-18	Feb 5-6
• Code the accessing of IO/PCB • Code accessing of input message with multiple segments • Routing output messages to alternate terminals	MC-19	Feb 23-24
IMS On-line Message Formatting (MFS)	MF-08	Feb 23-25
• 3270 I/O message segmentation • Message input/output descriptions • Device input/output formats	MF-09	Feb 25-27
IMS Data Base Design	MD-12	Send for schedule

INTERACTIVE PROGRAM DEVELOPMENT

TSO Time Sharing Options	TS-3	Send for schedule
CMS Conversational Monitor System	CM-4	Send for schedule

OPERATING SYSTEMS AND INTERFACE PROGRAMS

MVS Multiple Virtual Systems Debugging	SD-2	Feb 25-27
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For registration materials and further information on specific courses, circle appropriate course numbers on coupon and mail to:

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☐ Please send information on new course announcements and future schedules.

System to Speed Processing of Traffic Violations

Special to CW

SACRAMENTO, Calif. — The cost of prosecuting traffic safety violators in California is expected to drop with application of an integrated on-line/-batch processing computer system to a new program of the state's Traffic Adjudication Board (TAB) here.

The program is expected to speed up processing of traffic law citations and allow enforcement agencies in the most populous state to impose fines and other penalties with more consistency. The mainframe-backed program will also allow hearings for suspected offenders to be held at more convenient times and places, a TAB spokesman said.

A Sperry Univac 90/80 system currently used by the California Department

of Motor Vehicles will implement TAB's plan. The 90/80 is said to represent an integration of on-line input and retrieval coupled with downstream batch processing.

The on-line programs handle such time-dependent transactions as driver-record retrieval, the spokesman noted, while the batch programs handle bulk processing of the more routine transactions.

State Department

The TAB is a new state department whose operations are overseen by a five-member statutory board appointed by the governor. The board establishes regulations for processing and holding hearings on traffic cases and for hearing appeals from motorists.

ists.

Commenting on the new system, TAB executive director Tom Novi said that "the network of computer programs running off the Sperry Univac 90/80 processor very possibly represent the most sophisticated system of its kind in the world."

"For example, the 90/80 is currently programmed to automatically produce more than 50 'trouble-shooting' notices to TAB employees informing them of potential problems in the adjudication process from ticket issuance to final case disposition."

"Our expectation is that by maximizing the use of computer technology we will significantly reduce staffing requirements, enhance the convenience of motorists and still provide consistent

and fair treatment for all cited individuals," Novi stated.

"With our flexible two-tier processing environment, we can respond to the timeliness of real world data processing needs in a manner which maximizes overall systems efficiency," he added.

Program Features

Some features of the TAB program include:

- Traffic safety violations occurring within the project jurisdiction from Oct. 1, 1980 to July 1, 1984, will be processed and adjudicated administratively rather than in the courts.

- Maximum use will be made of computer technology and other modern information processing techniques to keep costs low.

- Motorists may schedule a contested hearing by mail with no arraignment necessary, thus eliminating the need for two appearances.

- Sanctions will be imposed according to a uniform sanction guide taking into consideration the driver's prior statewide driving record.

- An analysis of the program's costs and benefits will be made by independent expert evaluators.

The new procedures are expected to be less costly to administer than the current system since there will be no prosecution costs, no district attorney involved, no arrest warrants issued and fewer clerical support personnel will be required.

Police overtime costs should be reduced through automated scheduling of officer appearances. Salaries for traffic hearing officers will be substantially less than salaries of judges or traffic referees.

Other benefits will come from faster processing of citations — motorists may walk in immediately and receive a summary hearing without the citing officer present — and because drivers will only have to appear once to obtain a hearing.

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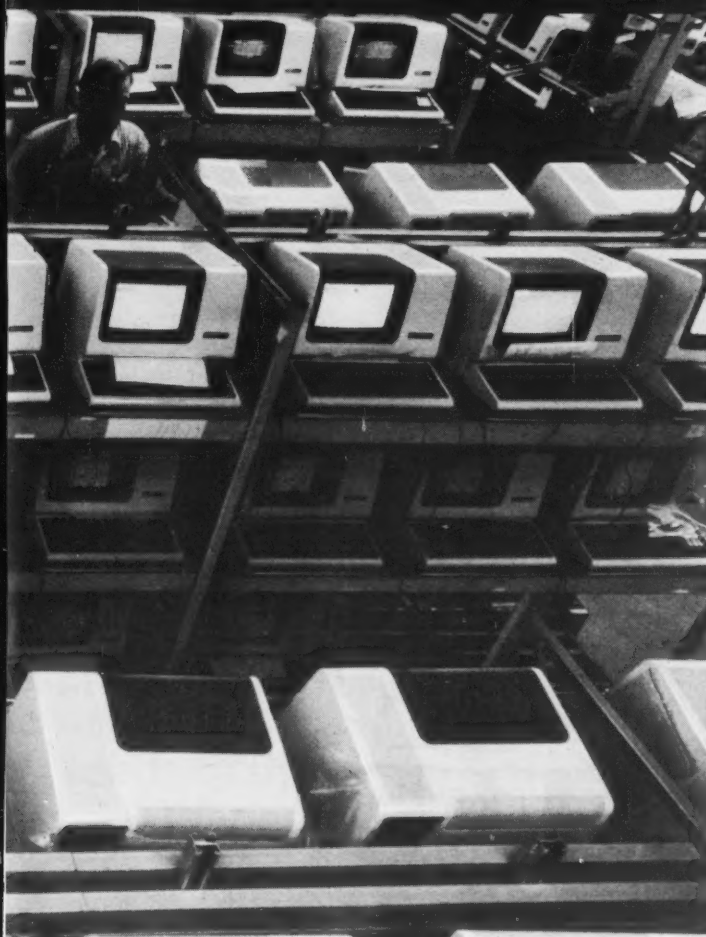
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Mini Fine-Tunes Inventory For Stereo Components Firm

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FRAMINGHAM, Mass. — When a manufacturer of stereo component equipment was looking for new ways to boost the accuracy of its inventory records, it found the answer right under its computerized nose.

Two-and-a-half years ago, Bose Corp. acquired a Hewlett-Packard Co. HP 3000 minicomputer and has been using it as a batch data collection machine and preprocessor to handle inventory and sales analysis data entry. The final data was then prepared by three separate service bureaus, according to Jim Dowling, the firm's DP manager.

However, since that time, the company gradually converted its fast-growing applications load to run in an on-line environment.

As a result of bringing its processing home, Bose has not only done away with the need for the service bureaus, but improved the accuracy of its inventory records by about 30%, Dowling claimed.

Time, Money Saver

"Converting some of our applications from batch to on-line meant a savings in both time and money," he said.

"As we began to do more work on the HP 3000, we dropped the service bureaus one by one until we were finally using the HP computer for inventory and order processing exclu-

sively."

Bose has been manufacturing stereo equipment for the past 15 years and supplies components to more than 200 dealerships worldwide. The company, based here, employs about 900 people, one-sixth of whom work in factories in Ireland and Puerto Rico.

The company's HP computer system initially consisted of five HP 2640 terminals tied to an HP 3000 with 50M bytes of disk storage and 128K bytes of main memory.

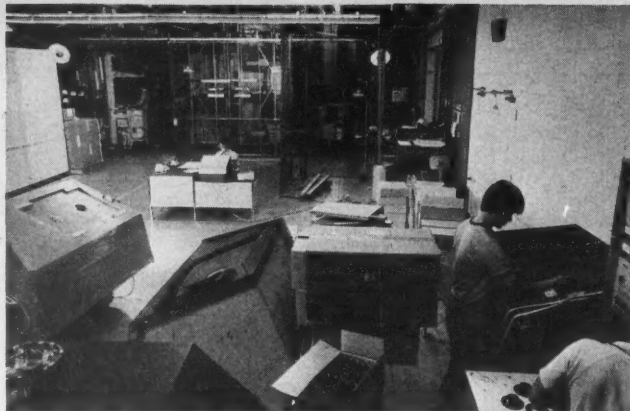
The terminals would do double-time, connecting Bose with IBM mainframes located at the service bureaus. Currently, the firm's headquarters has 34 terminals tied to a central HP 3000 Series III with 1M byte of memory and 420M bytes of storage.

During the dependency switch, Bose developed its own applications software, using Cobol as a programming language, and the HP Image/Query data base management system.

Tracking System

With the HP 3000, Bose has developed a materials tracking system, which keeps tabs on inventory beginning with the generation of requirements from a master production schedule through the creation of purchase orders, receipt of materials, stock transactions and cost analysis.

"We try to ship within five days. So, with that many systems to put together, it is necessary for us to be as



Since Bose Corp. purchased an HP 3000 system two and one-half years ago, payroll for 900 employees, inventory and sales analysis, accounts receivable and material requirements planning have been developed.

exact as possible in keeping up with what materials we have on hand, who has ordered what and the stage those orders are in," he said.

"Since we started using the HP 3000 for materials tracking, our accuracy rate has improved tremendously. In fact, a recent physical inventory showed less than 0.1% error on a \$2 million inventory."

Before switching on-line with the computer, Bose had a problem with inventory accuracy because of what Dowling termed "a lack of visibility." Without an on-line materials tracking feature, the previous system had difficulty pinpointing trouble areas. "Since going on-line with the HP computer," Dowling said, "we've been able to spot problems in our inventory before they

arise."

One of the major benefits the HP system has brought to Bose operation is timeliness, according to Dowling. He cited the generation of geographical sales reports as an example.

Under the old system, data on orders and sales were tabulated manually, and getting a geographical sales analysis into the hands of corporate directors could sometimes take as long as two weeks after a month-end closing.

As a result of the applications Bose has added with the HP 3000, a second system is scheduled to be installed this year.

This new system will be an HP 3000 Series 33 which will be used to develop the systems that will run on the larger Series III.

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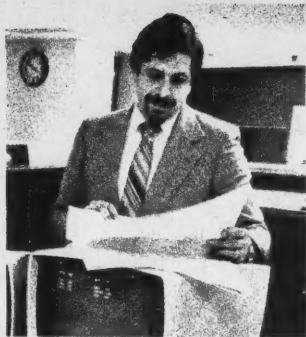
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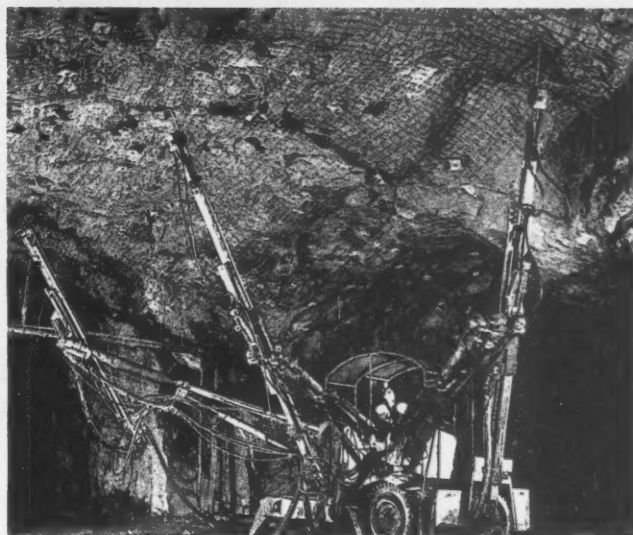
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Applications Software Lets Trucking Firm Drive Away With \$3.5 Million Savings

DENVER — Savings of nearly \$3.5 million from applications software?

That's the "conservative" estimated figure resulting from BN Transport, Inc.'s (BNT) implementation of IBM's Freight Equipment Reporting System for Transportation/Virtual System (Ferst/Vs).

The regional carrier, a subsidiary of Burlington Northern with some 23,000 route miles covering 16 states, installed all four Ferst modules — message switching, equipment control, overhead freight billing and rating — early in 1980 to replace a combination of on-line, batch and manual systems.

"Ferst is a telecommunications system, designed specifically for the trucking industry," President Charles A. McGee explained. "It provides us with the most effective tools and current information available for management control. The end results include lower costs, greater efficiency in operations and improved profits."

Savings Figures

BNT "started the clock" on Ferst for financial analysis purposes more than 11 months before the system went on the air. Although firm figures are not available, the break-even point was expected in the third quarter of 1980 and the annual net cash flow before taxes was projected at \$600,000. This year cash flow before taxes should exceed \$800,000, in 1982 it should top \$1 million and in 1983 estimates are for over \$1.3 million, according to a BNT spokesman.

"The savings figures are quite conservative, and we have verified them with at least two levels of management in all cases," said C.L. Luetger, vice-president of administration. "They don't include any 'funny money' — not an hour here and an hour there which don't realistically add up to savings."

"Nor do they include substantial 'cost avoidances' we are already achieving in equipment control," Luetger said.

Overhead freight billing information is entered into the system via IBM 3767 communications terminals in 31 out of 39 truck terminals. They are linked to an IBM 370/145 in Denver so the information becomes immediately available for multiple uses. Editing, routing and reporting have become a unified function that reduces operating costs by streamlining processing. This year billing labor savings will top \$116,000, and projections indicate more than \$200,000 in 1983, BNT said.

Full-time raters in Denver key data into seven 3278 CRT terminals, averaging 50 bills per hour compared to a peak of 30 bills per hour in the past, according to a BNT spokesman.

Control is also increased because data on the status of each shipment is available to authorized persons anywhere in the system. Savings in tracing costs are in the \$240,000 range this year and may top \$400,000 in 1983, he said. Management reports are available on a more timely basis — at estimated savings of nearly \$300,000 this year, and over \$500,000 in 1983, he said.

However, management personnel agree that the biggest reporting savings are from the effects of improved reports — more data, more quickly and accurately available, in the most usable form.

Equipment Control

BNT is also realizing major savings in equipment control. At the close of 1979, the combined city and line-haul fleet numbered 515 tractors, 1182 trailers and 52 trucks. By the end of 1980 about 50% of the trailers were expected to be parked because Ferst allows the firm to plan equipment use with greater flexibility and efficiency.

"When we put in Ferst, our line-haul tractor-to-trailer ratio was one-to-six. It is now nearing one-to-three," said Gary R. Morgan, director of transportation. "Each day we randomly pull equipment utilization reports on the truck terminals, check on idle or excess equipment and park it. We already have over 35% parked and will use the equipment only for emergency or replacement purposes," he said.

"Originally, we expected to spend about \$3 million this year for new equipment, but we'll spend only about \$1 million. And this hold-down on equipment will continue. Consequently, if business volume continues about the same, we estimate we'll also save from 25% to 30% on maintenance and fuel," Morgan continued.

"I was brought up in an old-time trucking operation with manual systems. And other computer systems I've worked with often had confusing coding," L.E. Marek, area manager, said. "So I was expecting the worst with Ferst."

But, "somebody who knew something about trucking wrote this program because the codings we key into the terminal are so easy to understand," he said.

"It not only helps locate lost freight within 48 hours, it also helps pinpoint a destroyed bill and stolen freight," Marek said. "This greatly increases security and customer service, compared to past procedures where it sometimes used to be weeks before a problem could be traced."

"Ferst accepts no mistakes — the input must be accurate and if we attempt to enter an error, the computer tells us right away in understandable English," Marek said. "It keeps everybody in the [truck] terminal accurately informed."

BNT implemented Ferst via a planned project management approach in cooperation with an IBM Application Transfer Team (ATT), said Luetger.

"We installed the 768K-byte 145 on Aug. 1, 1979 and began working on the Ferst programs in mid-September. We had six programmers before we started and our original proposal called for adding another two, but we only had to add one," Jens Nielsen, director of systems and DP, recalled.

"Despite the fact that we went on it 'cold turkey,' our problems were minor and what little debugging was necessary we were able to handle in slack times," Luetger noted.

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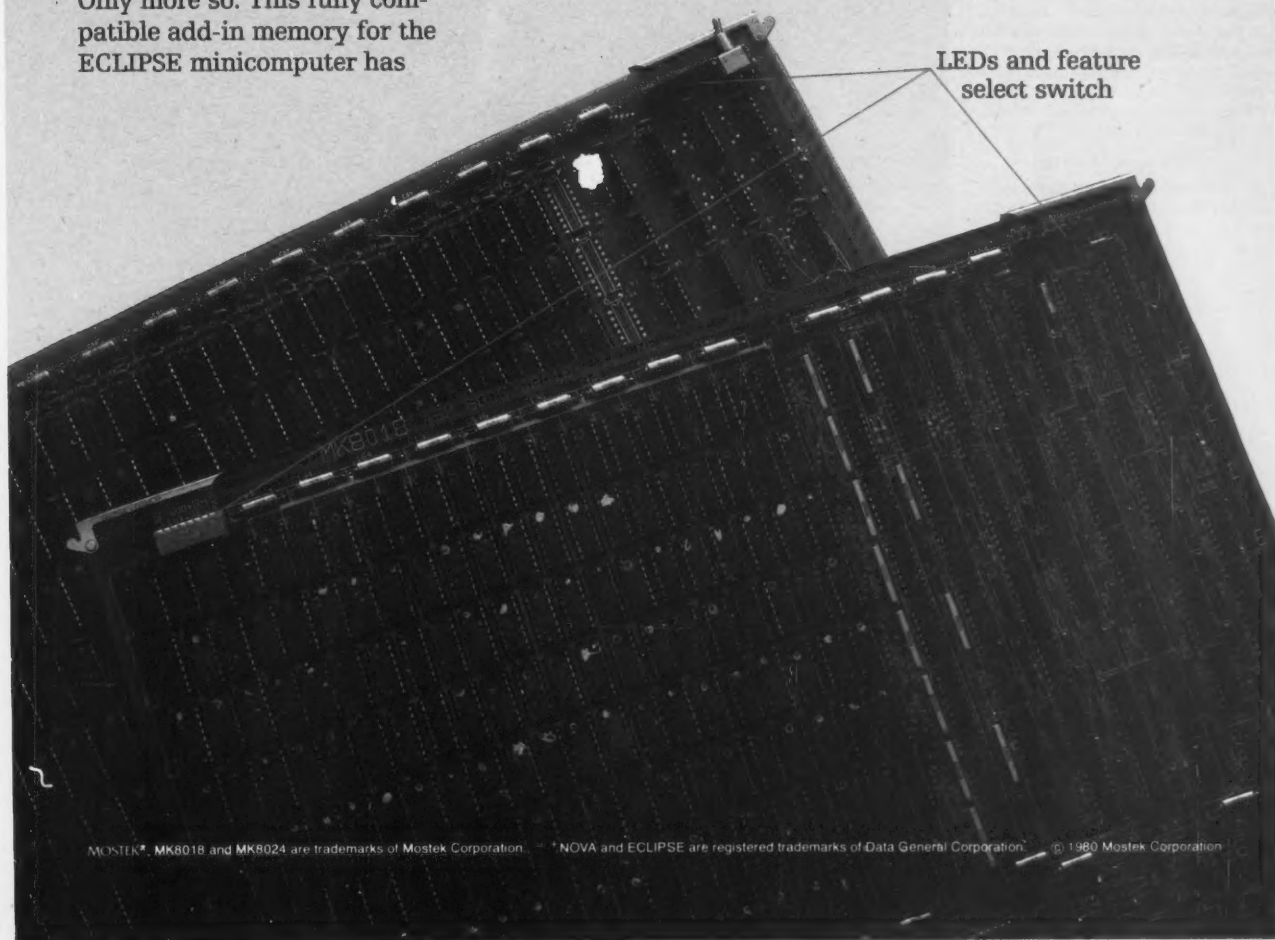
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CPU Slates 99% of Classes Schools Solve Custom Scheduling Problem

ANNAPOLIS, Md. — When IBM's 360 scheduler proved inadequate to the needs of the Anne Arundel County school district, Ernest M. Clayton Jr. went to an Association for Educational Data Systems (Aeds) conference to review available applications packages for secondary school scheduling.

"We have some 40,000 students in our county's 29 secondary schools," he pointed out. "And I don't think any two of the schools had the exact same requirements. Each school had different considerations, the most important of which was the various grade combinations in the schools — anywhere from sixth and seventh grade in one school, seventh through 12th in another and 10th to 12th in a third," he said.

The answer was to find a framework for a system that could be adapted by each school, he said.

The IBM package that was being used was the old 360 scheduler, he recalled. It was oriented to traditional college arena-type scheduling, and it required an inordinate amount of in-house rewriting just to get by, he said, adding, "it wasn't adequate for current needs and growth."

Every package discussed at the conference would have meant a compromise in the district's goals, he said.

"We were told that if we would acquire more hardware, there was a software package just right for us. As it is, we have limited internal staff to handle our district's [systems]," he noted.

And Clayton did not want to utilize an outside service bureau where he would be adding unbudgeted costs because of the large number of students without maximizing the installed Model 138's available time.

'MacSocrates' Package

In 1979, he finally learned of a variation of IBM's Socrates school scheduling package being used in a service center environment for a number of nearby Pennsylvania and New Jersey schools.

The service bureau was an operating group of Management and Computer Services, Inc., Macs, offering the necessary capabilities.

And, the MacSocrates package included on-site support of the individual schools and school districts using the software during the first phase of the scheduling program, Clayton said. IBM was not willing to provide its support, he said.

"We asked if the MacSocrates system would be available for lease to us with certain enhancements since the combination of that software with the JCLMacs package seemed to answer our needs," Clayton said. The software firm realized it could gain a return on its investment in Socrates modifications and enter a new market area by applying the modifications to the IBM-leased package.

Since Socrates is a proprietary package, Clayton leased the software from IBM and put it on a figurative shelf, based on advice from Macs. The modified package was then installed on the Anne Arundel computer and IBM gained a user it was not in a position to support, according to Clayton.

The package supplied capabilities not offered by IBM and helped record a

94% schedule for the first school, Virginia Myers, administrative manager at Howard county, said.

"Macs' greatest value is as liaison between the schools and the DP office. [The vendor] understands the people problems associated with scheduling and can explain the problems in terms the principals understand," she said.

Efficient Matching

"Scheduling is not just putting students in classes and placing a teacher in charge," Clayton explained. "Budget requirements demand efficient matching of students with classes, teachers, facilities and available time periods so that school resources are

employed most efficiently.

"The people from Macs had enough experience with secondary schools so that they were able to train our people, stay with them and offer advice as needed and help us start assembling a master schedule," he said.

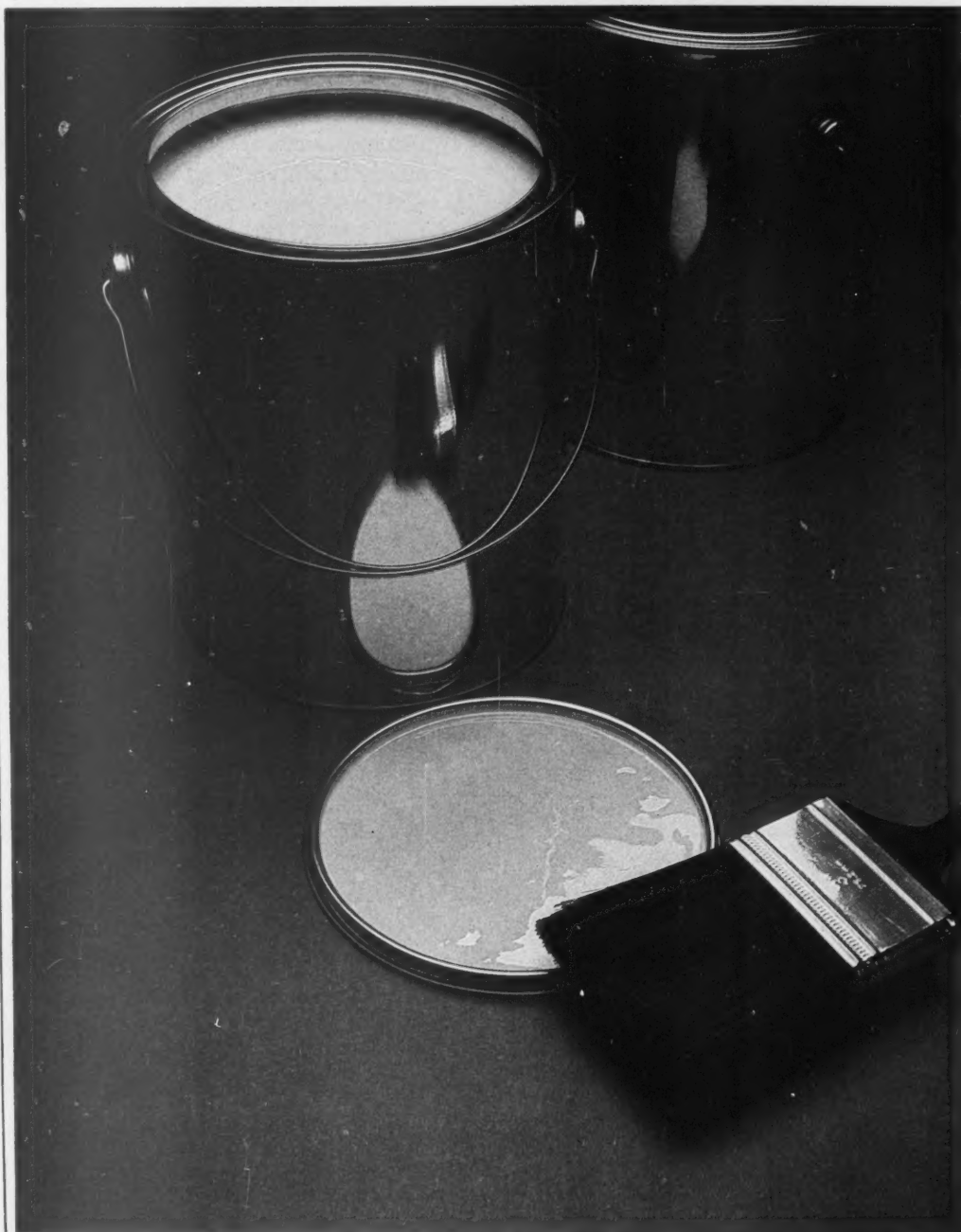
"We were able to build a master schedule that encompassed room, teacher and course limitations and gave us the ability to override a restricted schedule as needed."

The second Maryland Macs user provided scheduling for seven schools in Charles and St. Mary's counties with the package, according to Harrieton Merritt, an administrator in Charles

County.

"One school scheduled 1,395 of 1,400 students with MacSocrates while five others did better than 90%," he said. Future plans include "adding grade reporting, resource allocation and other information areas" to the system.

"The software allowed us to perform scheduling under a wide range of alternatives: student priority scheduling and course priority scheduling, student-selected alternate courses as well as schoolwide alternate courses, scheduling restrictions by sex, grade, ability and location and other areas such as homeroom and study hall assignments and class balancing," he noted.



Packet Net Gives Hospitals Remote Diagnoses

HOUSTON — Doctors at remote hospitals who rely on Houston Methodist Hospital's pulmonary diagnostic capabilities have saved time and money by switching from the mails or long-distance dial-up communication to a public packet communications network.

The 15 remote users of the system — as far away as Carlsbad and Hobbs, N.M. — take advantage of the program and data base developed a decade ago by Houston Methodist, a leading center for the treatment of pulmonary disease.

Supplied with test data, the program compares the results to normal pulmonary functions, displays data graphically and in tables and prints out an interpretation and summary based on

historical records.

The attending physician interprets the diagnostics according to the history and symptoms of the particular patient.

"The doctor retains control of the data and its interpretation, and of the patient," stressed Karen E. King, technical director of the hospital's pulmonary physiology lab and head of its medical communications network. The physician must countersign each computer interpretation before it can be implemented.

The system supports all levels of testing from a simple measure of the amount of air reaching the lungs and blood gas tests to complete pulmonary profiles.

The data is entered via a keyboard

terminal, and an IBM 370 monitors all entries for gross inaccuracies, rejecting obvious errors. This part of the process can be performed by clerical personnel, saving physician and technician time, King explained.

As soon as the data entry is complete, the program prints out a chart of the results and an interpretation. Data is kept on disk for three months for immediate recall, then is transferred to tape archives that are available on request.

The system is totally transparent to the user, though Houston Methodist Hospital can call up the data for consultation purposes if the attending physicians request this service. Data can be entered over any 300 bit/sec Ascii terminal. All revisions to the pro-

gram are available at no extra charge to outside users.

Modifications, in fact, are mainly due to user feedback from both inside and outside the Houston center. The Methodist Hospital pulmonary lab records how often an opinion must be added to a study to make it relevant to a particular set of data; the opinions are added by the attending physician.

"If we see a base pattern needing addenda frequently, that tells us that we need another branch of logic," King noted.

Service Expansion

The pulmonary program was first made available to other Texas hospitals over intrastate Wats lines. When out-of-state hospitals expressed an interest in joining the network, King began looking for alternatives.

"Staying with the phone company meant using out-of-state Wats, which would have increased costs significantly," she explained.

The network services offered by Tymnet, Inc., however, seemed made to order, she indicated, since "all of our data is transmitted digitally, and Tymnet has a nationwide distribution, charges less than the phone company, and gives good accountability."

Tymnet tracks network use and each month sends the hospital a tape showing how long each user has been online.

Tymnet charges are based on the volume of data characters transmitted and a time charge; Houston Methodist Hospital passes these costs on to its customers, and charges a flat rate for each test: from \$1.50 for a simple blood gas report to a peak of \$8.50 for the most complex pulmonary profile.

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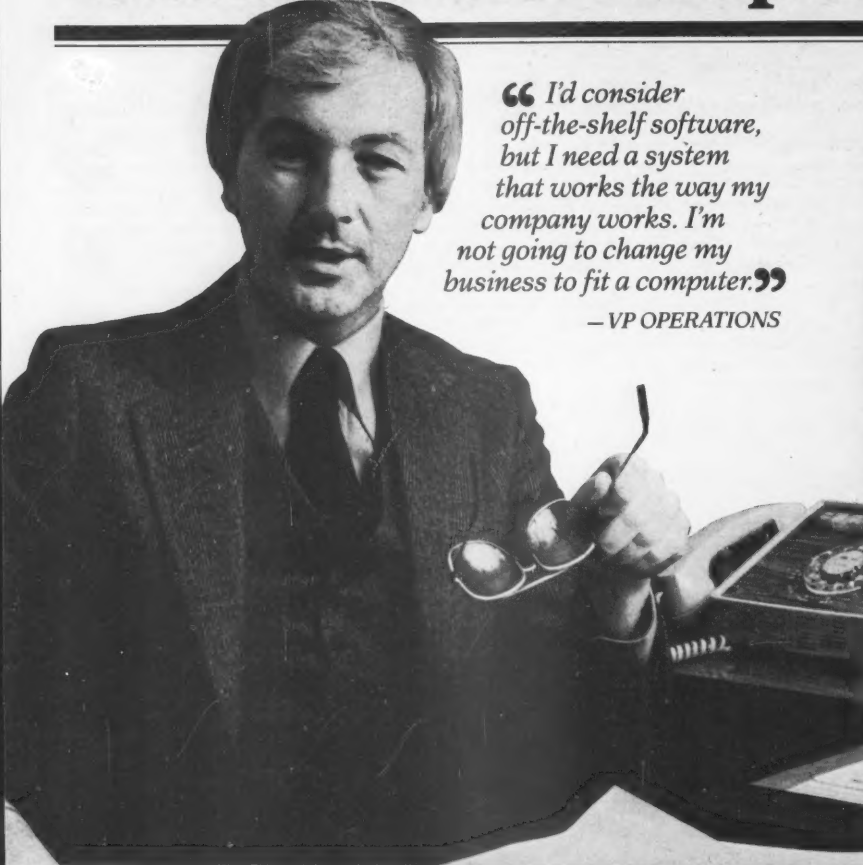
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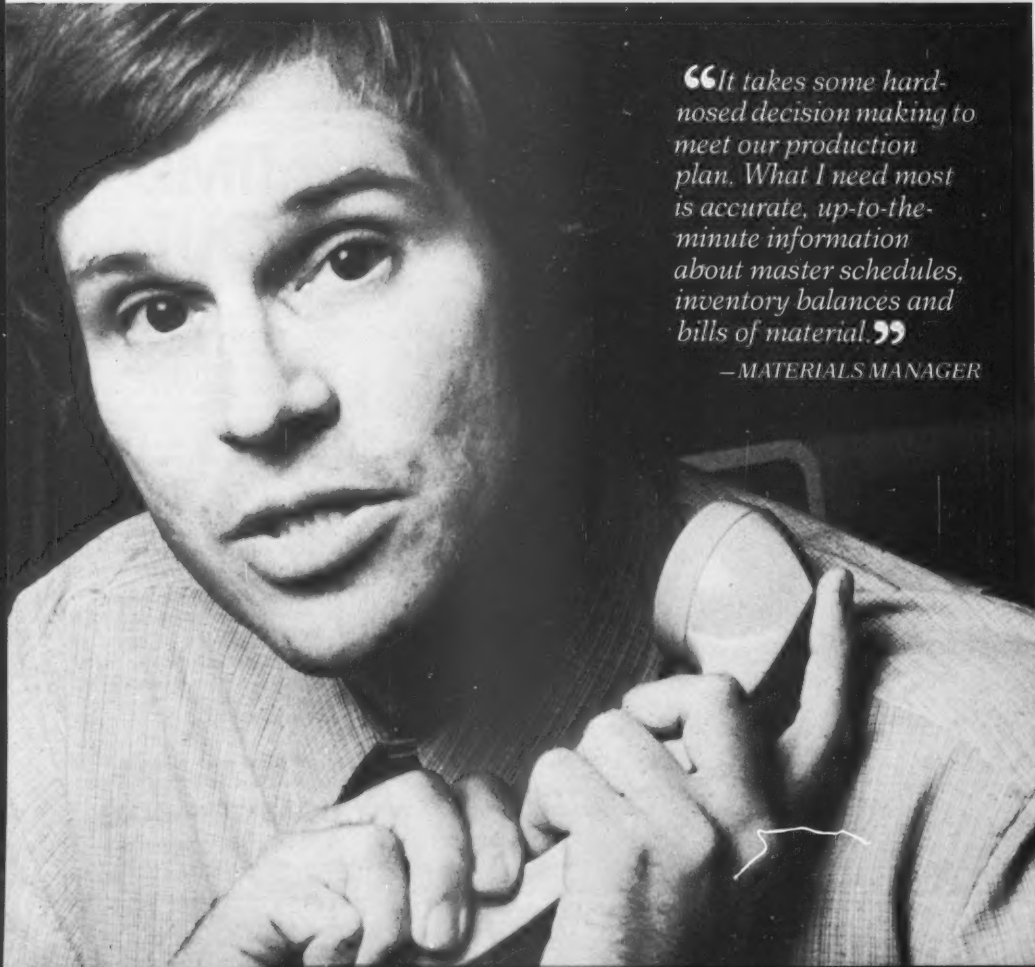
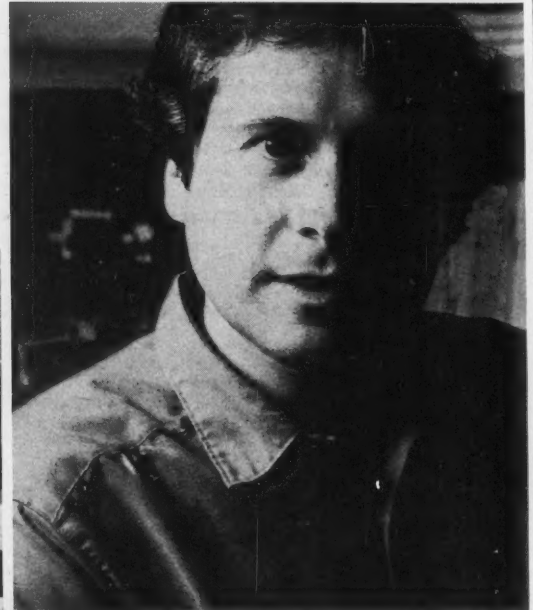


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Tomorrow's DPers Today

Programs Spark Youthful Interest in Computers

By Bill Laberis
CW Staff

Just as DP courses have become a part of some high school curricula, community-based programs aimed at furthering computer literacy have also sprung up.

Computertown, in Menlo Park, Calif., is an example of an experimental program designed 18 months ago to promote computer literacy by demystifying microcomputers, according to Pat Cleland, program coordinator.

What began as a voluntary program using donated equipment today has evolved into a computer outreach project funded by a \$240,000 National Science Foundation grant.

Another fledgling program — of national scope — is a cooperative venture between the 10,000-member Association for Systems Management (ASM) and the Explorer division of the Boy Scouts of America.

The 125 local chapters of the ASM throughout the U.S. and Canada are being asked by the association's Cleveland headquarters to sponsor Explorer posts specifically oriented toward DP.

The idea here is to give the Explorers, young men and women aged 14 to 20, a firsthand view of possible careers in DP and systems management, learning from association volunteers working in local industry.

Both programs, still in their infancy,

are simple, their methods largely untested.

But program developers are hopeful that the DP orientation will spur in the youths a lasting interest in computers and systems management, one that will help meet the expected future demand for DP professionals.

Today's Fun

"Today, they're having fun playing with microcomputers and designing simple programs, but these kids will be the developers of tomorrow's new and innovative software," Computertown's Cleland said.

Computertown now has four microcomputers permanently installed at the

Menlo Park Library, including three Commodore Business Machines, Inc. PET 2001s and an Atari, Inc. 400, as well as a Radio Shack TRS-80 Model-1 Level-2.

The program is also planning to buy color television sets as well as a centralized disk drive for use on all equipment, Cleland said.

And although the equipment and informal instructional classes are open to anyone in the community, Cleland said it is the kids who are the most interested participants in the program.

"For one thing, we're right in the middle of Silicone Valley here, so the kids are not total strangers to computers to begin with," she said. "But they also have a natural and uninhibited curiosity about computers. They just jump right in, where the adults are more cautious."

The parents of the children, too, are slowly being drawn to the library and classes, and the Computertown staff has found another curious and willing audience in the elderly.

Tomorrow's Career

The children, however, some as young as eight years old, remain the focal point of the staff's efforts. And while not actively promoting the marketability of the kids, Cleland reported that some of them are already cashing in on what they have learned, such as one 15-year old who earned \$1,000 per month last summer working as a systems programmer for a local company.

The final results of the computer awareness experiment in Menlo Park will be published as a self-help instructional guide and mailed to over 700 libraries nationwide.

The Explorer program, which has just gotten under way, could potentially reach a classroom audience of more than 400,000 young men and women nationally, according to Bill Andrews, director of information systems at the Boy Scouts' Dallas headquarters.

The association, founded in 1974, counts as its members many systems analysts, programming managers and other DP professionals.

ASM Contribution

"The ASM people, once a post is set up, will provide the Explorers with both the adult leadership and the teaching facilities," Andrews explained. "As everyone knows, there's a tremendous growing need for DP personnel. We and the ASM figure this program is one good way to answer that need, to try and spark greater interest in the field."

Andrews, who designed the program, said posts in the Dallas and San Antonio, Texas, areas have already been established, and said the coming year will see the formation of many more across North America.

"Our kids are getting the opportunity to try, fail without prejudice, and try again," said Frank Greenwood, post committee chairman of the Explorer DP Post in the Dallas area.

Formed nine months ago, the 22-member post has taken several plant tours "and saw the DP equipment being built firsthand," Greenwood said.

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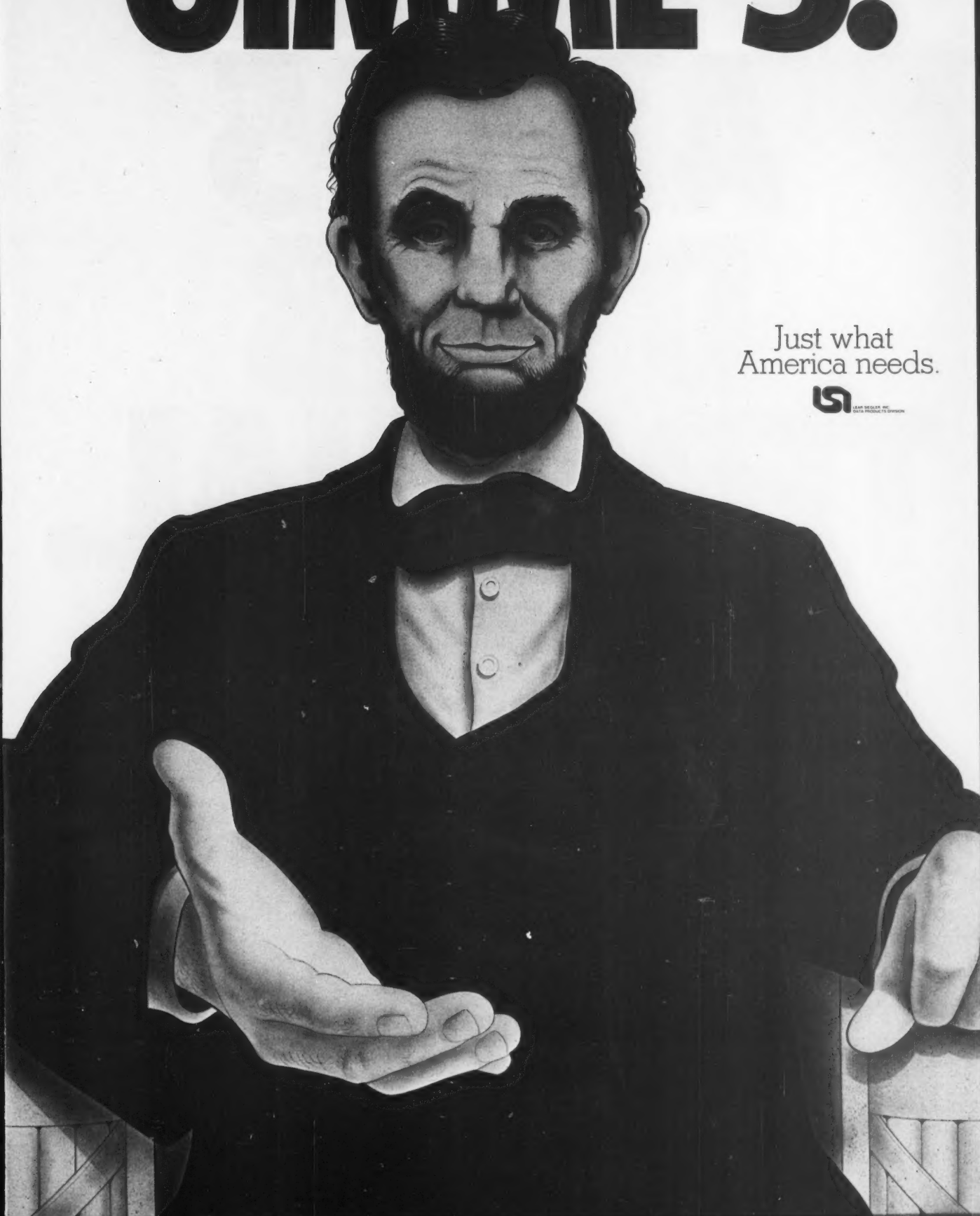
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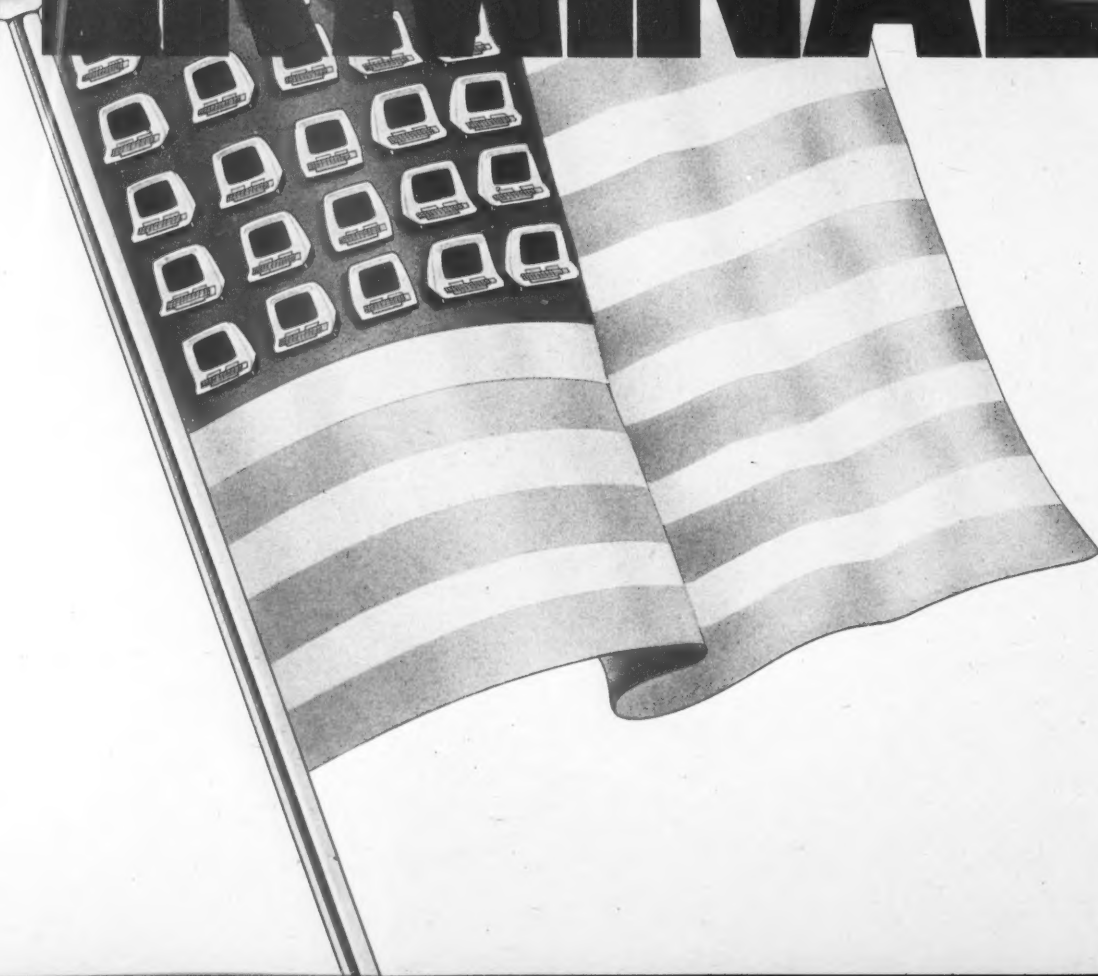


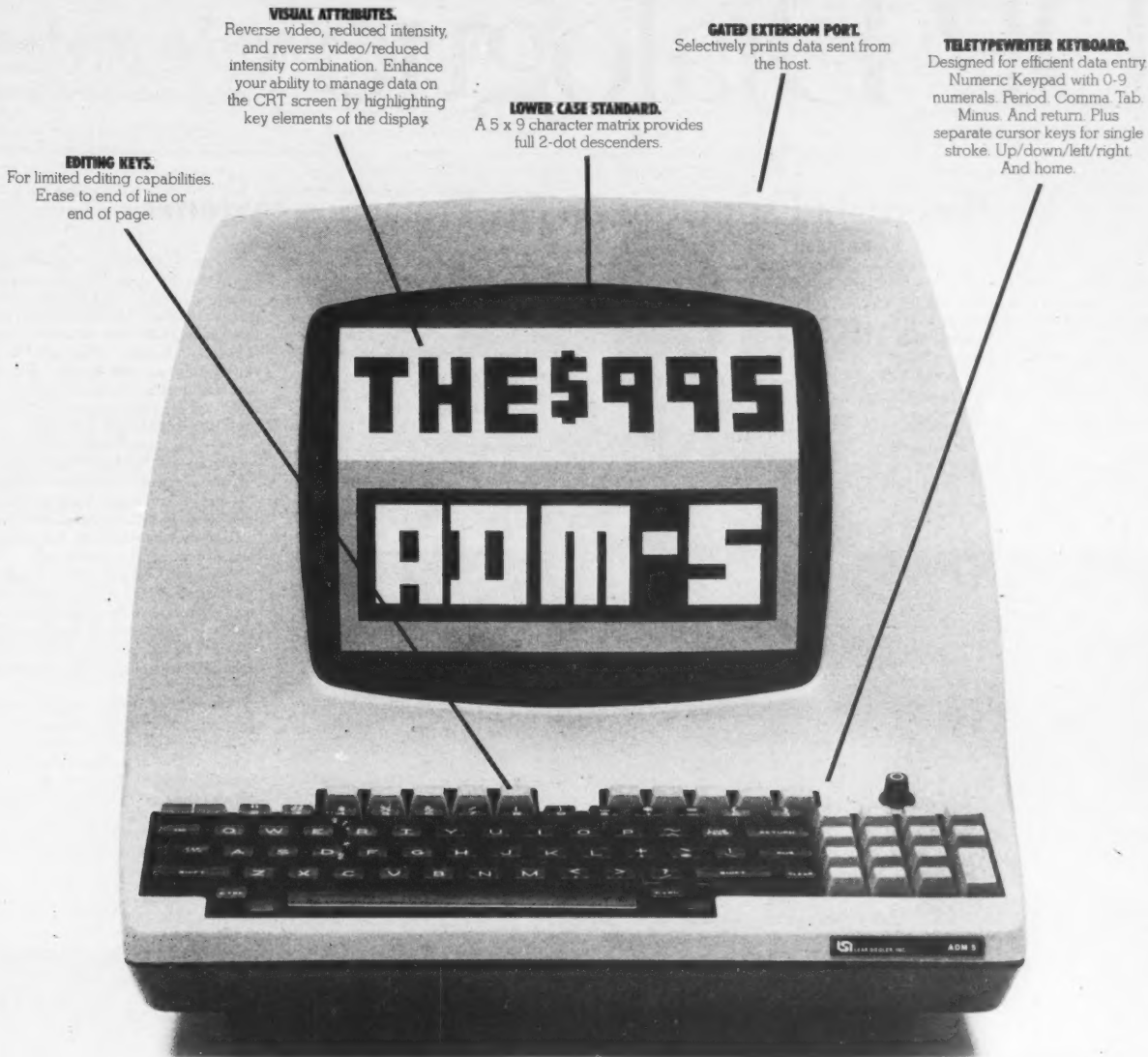
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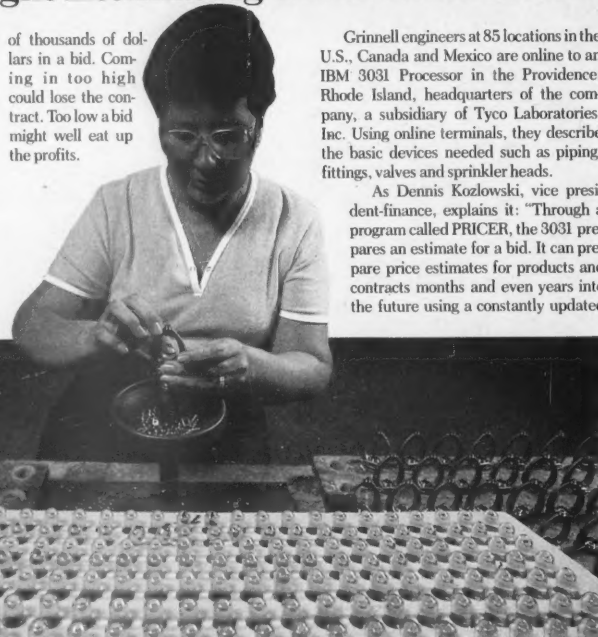
Notes and observations from IBM that may prove of interest to data processing professionals

Watertight Estimating on Fire Protection Systems

"With the help of our computer we're able to bid and close more jobs," says Bill Testa, Eastern division engineering manager for Grinnell Fire Protection Systems Company, Inc. "We get our complete hydraulic design and cost estimate in a matter of minutes instead of days, with accuracy that would be impossible for us to achieve manually."

Testa explains that some large facilities might need as many as 30 or 40 separate sprinkler systems, each having to meet different specifications such as water density and other design parameters. A small variation in pipe size might mean the difference

of thousands of dollars in a bid. Coming in too high could lose the contract. Too low a bid might well eat up the profits.



A 175° quartzoid sprinkler is assembled at Grinnell's manufacturing plant in Lubbock, Texas. An IBM computer helps out in everything from designing and bidding to pricing and inventory control.

Grinnell engineers at 85 locations in the U.S., Canada and Mexico are online to an IBM 3031 Processor in the Providence, Rhode Island, headquarters of the company, a subsidiary of Tyco Laboratories, Inc. Using online terminals, they describe the basic devices needed such as piping, fittings, valves and sprinkler heads.

As Dennis Kozlowski, vice president-finance, explains it: "Through a program called PRICER, the 3031 prepares an estimate for a bid. It can prepare price estimates for products and contracts months and even years into the future using a constantly updated

data base of forecasted price escalations.

"Once the contract is signed, another program, which we call LISTER, is able to prepare a bill of materials that goes from any of our 85 locations directly to one of Grinnell's five plants in the United States. LISTER also provides due dates when the material is needed at a construction site and acts as a perpetual inventory system for over 10,000 parts."

"Our engineers like the idea of being online to a 3031," says Lou Chiesa, director of management information systems. "They don't have to wait to get the answers they need. In fact, we come close to 99 percent machine availability during the 24 hours a day that the computer is up."

"And we're expanding into computer graphics. Engineers at many of our locations can now key in the rough design information at their terminals and get back a complete alphanumeric line drawing of the system, showing all sprinkler locations and dimensions."

Grinnell was the first company in the industry to do all its hydraulic design and estimating by computer. Earl Page, president, feels that "the computer has helped us make full use of all our resources. It has been an important factor in our impressive growth."

"It's pure and simple," Testa adds. "In this day and age we couldn't get along without the computer."

WIRS Wraps up 747 Wiring in a Neat Bundle

As a jet airliner is designed and built, the details of its electrical system undergo constant change. For the 747 jumbo jet, Boeing Commercial Airplane Company uses a computer to keep track of each piece of wire.

Since there are extensive wiring differences for different customers, and even among individual planes, Boeing uses interactive computing based on the IBM Information Management System/Virtual Storage (IMS/VS). This permits changes and variations to be entered immediately, as they arise, and allows engineering and manufacturing people to stay abreast of the configuration for each plane.

Running on an IBM 3033 Processor in Kent, Washington, the Wire Information and Release System (WIRS) stores the identity of each of 49,000 segments of wire in a 747, and its assignment to a bundle, Robert M. Beers, functional manager, WIRS, explains. Through the design, release, and fabrication of the bundle, WIRS identifies the device or connector at each end of the segment, the wire type and gauge, and the aircraft to which it applies. Data is added or changed by filling in blanks on the screen of a terminal in one of five plants in the Seattle area or the Boeing plant in Wichita, Kansas.

During an average week, 500 engineering change notices are entered against the wiring of the 747, affecting one plane, all of them, or a limited number. For each entry, WIRS performs 38 engineering edits which identify such errors as two wires using the same pin or the same wire number, release sequence errors, or connectors that don't match. Other automatic checks catch invalid wire codes, aircraft effectivity errors and the like. "By catching errors before they get into the system," Beers points out, "we cut the total number of basic changes to be processed by 25 percent. And we accomplish more of them in sequence, without reworking a bundle of wires that is already completed."

"IMS lets us access a wire or bundle in many ways," says Beers. "Engineers can look at a particular bundle or equipment item, or look for all wire of one type. They can go in by airplane number, change number, or by customer. Since a complete history is retained, they can look at past configurations, and see when a change was made."

"Today, we roll out seven 747's a month," Beers continues, "for any of 64 different customers. Since there is less lead time on wiring than on any other part of the design, we couldn't sustain that production rate without such a system."



A Boeing 747 jumbo jet contains two tons of copper wire: 49,000 separate segments. Keeping track of the details of this massive electrical system requires the services of a large IBM computer.

DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

IBM
DATA PROCESSING DIVISION

With \$15 Million Network System Moves Small Hotels Into Big Leagues

PHOENIX — Chalk one up for the little guys.

At a time when the economy is taking a heavy toll on many balance sheets, business is booming at the 2,600 small, individually owned hotels, motels and resorts associated with Best Western International, Inc.

According to Bob Hazard, Best Western's chief executive, a cornerstone of that success is a worldwide "instant" reservations and communi-

cations system and "its ability to deliver 15% to 30% of a property's occupancy at a cost of less than half that of competitors.

"Computerized reservation systems are by no means new to this industry," Hazard admitted. "However, the significance of our system is that for the first time smaller hotels, motor inns and resorts have the best marketing and reservations system in the world."

Best Western recently pushed the button on the \$15 million network that links Best Western properties nationwide with 18 countries. Hoteliers in places like Menominee, Wis., and Limerick, Ireland, soon will be using IBM 3101 CRT terminals to route reserva-

tion data to strategically placed IBM Series/1 minicomputers, which will communicate with Best Western's computer center here in Phoenix via satellites.

"Our industry's basic service hasn't changed in hundreds of years," said Jerry Pettit, Best Western's vice-president of operations. "But what you're seeing today are the small independent hotels leading the technological race. Booking a room in a vacuum isn't what we need. What we need is the ability to make and change reservations rapidly."

Best Western officials noted that today there is a two-day turnaround for European travelers booking a room in

the U.S. — not only slow, but costly and error-prone as well. With the computer network, Hazard said the process will take about 30 seconds, cost less, and help ensure accuracy.

The next step in what one executive called Best Western's "electronic umbilical cord" will be more sophisticated links to airline computers and the thousands of travel agents who routinely use them. Plans are also under way to develop a property management system tailored to the needs of each hotelier.

Best Western, by "wearing both a marketing and technology hat," has increased its market share from 5% in 1975 to 11% in 1979, Hazard said.

Call for Papers

THE FIFTH WESTERN EDUCATIONAL COMPUTING CONFERENCE, San Francisco, Nov. 19-20.

This consortium of computing educators and professionals is seeking original papers dealing with computers and computer applications.

Abstracts and papers in duplicate, double-spaced form, not exceeding 1,500 words in length, should be sent to Prof. Elizabeth Alpert at the Computer Science Department, Hartnell College, 156 Homestead Ave., Salinas, Calif. 93901, no later than March 1.

FIRST IASTED INTERNATIONAL CONFERENCE AND EXHIBITION APPLIED MODELING AND SIMULATION (AMS '81), Lyon, France, Sept. 9-11.

The scope of the conference covers numerical methods, graphical techniques, languages, software, hardware, computer assisted modeling and operations research methods. Special emphasis is on applications in all fields including physics, chemistry, metallurgy, all areas of engineering, wood, pulp and paper, power systems, process control, robotics, terrestrial and aerospace vehicles, energy systems and sources, physiology, medicine, food and agriculture, soil sciences, hydrology, seismic applications, education, sports, sociology, management and economics and water resources.

Regular papers and tutorials are being solicited. Three copies of a 200-word abstract should be submitted to the Secretary by March 1. Complete manuscripts of accepted papers are due July 1 for publication in the proceedings.

For correspondence and submission of abstracts write to the Secretary, AMS '81, AMSE, 16 Avenue de Grange Blanche, 69160 Tassin-La-Demi-Lune, France.

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With DP One-Third of Budget, Credit Firm Stays Competitive

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DALLAS — Most large corporations, active in many different business areas, typically have a DP outlay that equals 1% of sales. Chilton Corp., however, is dedicated to only one business — consumer reporting and collection services — and its DP costs run as high as one-third of the company's total operating budget.

What this means is that Chilton, like other small companies, cannot as readily absorb the capitalization, expansion and maintenance costs associated with large computer systems. Already at a dollar disadvantage in an extremely competitive market, it remains vulnerable to differences and fluctuation in computer system pricing.

Chilton claims second place in a field that includes five consumer credit reporting services nationwide, all vying for a market that may have in excess of 150 million consumer credit applicants per year. Chilton alone — with 20% of the market — answers nearly two million credit inquiries every month.

Sound Alternative

Faced with the need to spend funds efficiently as well as to obtain promised deliveries on time, Chilton decided to go outside the mainstream of multipurpose computer manufacturers. To Chilton President Van Smith, only one supplier offered a sound alternative.

"Four years ago, when we were ready to purchase a high-performance system, an IBM 370/168 was selling for more than \$5 million. When we finally bought our first Amdahl Corp. system — a 470-V/6 — we ended up with even greater performance than a 168 at only 65% of the cost, a savings of almost \$2 million.

"And we saved even more dollars when we bought a V/5 in 1978, which was traded for a V/7 last year," Smith said.

"What this cost-effectiveness has done," he added, "is permit us to stay competitive with the larger companies that can afford to pay the higher prices. It gave us the ability to move into high-volume processing and deliver a service that would have been financially straining otherwise.

"It has also kept the price increases of our services to the customer well below the rate of inflation, typically 3% to 4% annually. We've been able to lick the high cost of computer systems and annual rates of inflation."

Prior to the present Amdahl computers, Chilton had an IBM 370/145 and an IBM 370/158.

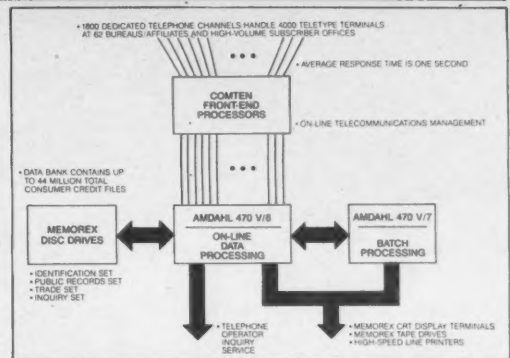
"It is significant that, of the

five consumer credit reporting services, three of them presently use Amdahl computer systems — TRW, Inc., Pinger and Chilton," Smith continued. "So, it is safe to assume that performance as well as price was a motive in buying Amdahl."

Chilton's relationship with Amdahl extends to most of the other vendors that supply pe-

ripherals — primarily Memorex Corp. for CRT terminals, disk and tape drives, but also including Comten, Inc. for front-end processors, Paradyne Corp. for modems, Mohawk Data Sciences Corp. (MDS) for remote printers, and Documentation, Inc. for printers, card readers and card punches.

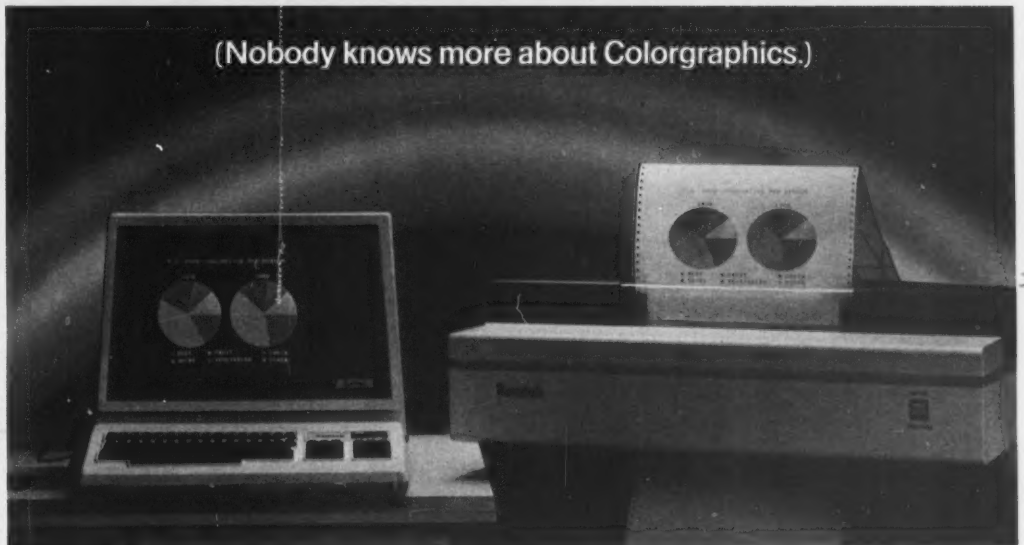
(Continued on Page 46)



Chilton Corp. Consumer Credit Reporting System

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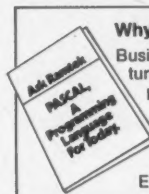
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A data processor checks programming information on one of many Memorex 1377 CRT terminals used to access the computer systems at Chilton Corp.

DP Cost-Effectiveness Keeps Credit Firm Competitive

(Continued from Page 45)

In Smith's words, "The relationship that Chilton has with its suppliers is that all of us are competing with someone bigger. Since our product lines are pretty much specialized — with fewer diverse activities to divide our attention and lower efficiency — they understand what our needs are. Consequently, our channels of communication with these companies are very smooth and direct."

"All told, it has cost us \$6 million for mainframes that probably would have cost \$15 million to \$20 million had alternatives not been considered."

Saving money on a computer system may be the overriding concern, but to

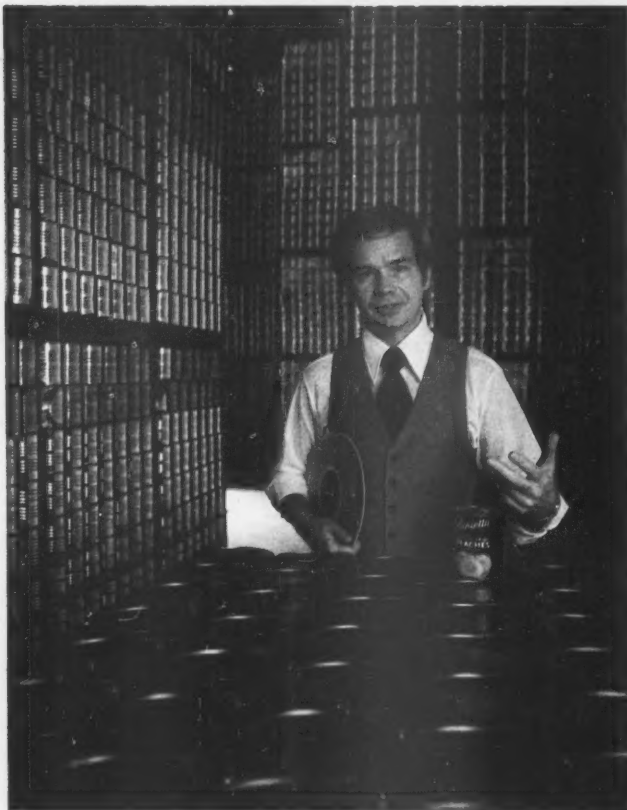
a company like Chilton, other factors have also contributed to its success. "Take delivery time, for example," Smith said. "If we had just a mild business growth over the last 10 years, we probably could have lived with IBM's delivery schedules. But Chilton's growth has been phenomenal, and if we had to wait for a new computer or more disk drives, we might have passed some new business opportunities. There have been times in the past when we couldn't get a much-needed terminal from IBM for 18 months or more."

Perhaps more than any other factor, Smith said, system reliability plays an important role in Chilton's success. Since the Amdahl systems have been installed, Chilton has never had a major service interruption, he noted.

At the present time, Chilton uses its Amdahl 470V/6 (acquired in February 1977) to process all on-line credit inquiries from its 62 bureaus and affiliates. Although the 470V/7 (which replaced the V/5 in June 1979) is primarily used for batch processing, it can be switched to on-line communications at any time, suiting it as a backup for the V/6. The present memory capacity of the V/6 is 6M bytes, with 8M bytes for the V/7.

Peripheral equipment at Chilton includes a large number of Memorex 3228 tape drives and 3650/3675 disk drives, Memorex 1377 CRT terminals, Comten 3650 front-end processors to handle large-volume traffic switching (one is actually a backup) and high-speed Documation 2,250 line/min printers in-house.

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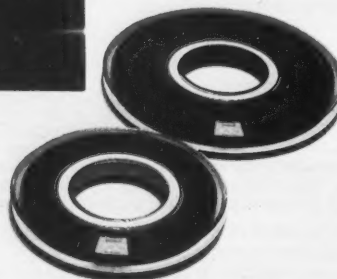
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Leonard Kleinrock, from the University of California at Los Angeles, Wushow Chou, from North Carolina State University, and Lawrence Roberts, president of GTE CNS Products, will discuss packet switching, public packet networks, Systems Network Architecture and network design issues.

Registration costs \$675. More information is available from Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.

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Frank J. Sanzone, Jr., is Assistant Director of Finance, Carroll County General Hospital, Westminster, Maryland. Robert Monogue is an NCR Representative.

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Slower Benchmark Times, Lower Cost

Apple May Win in 'Least Expensive' Category

One of the industry's most popular personal computers, Apple Computer, Inc.'s Apple II, did not match benchmark times of more expensive systems, but does appear headed for victory in the "least expensive" category. The Apple underwent testing in the Association of Computer Users' (ACU) Series 1 Benchmark Reports.

Priced under \$4,300 for a complete system with dual minidiskettes and Centronics Data Computer Corp. 779 printer, the Apple II can be configured more cheaply than that and features an entry-level price below \$1,000.

While the system's benchmark test results were slower than some others we've looked at, they were not unreasonable so, especially considering the fact that this is a minimum-cost setup. However, potential business users should be aware that systems in this price bracket may lack sufficient diskette storage, memory capacity and system expandability for use in a general accounting application, except in a very small business environment.

Instead, the Apple finds applications where less computing power is needed. In the business field, Apple finds more use in management planning and personal financial planning. While an accounting package is offered, the firm states that it is designed for use in businesses having fewer than 500 customer accounts, 100 vendors and less than \$1 million in total dollar volume annually. Some dealers are even more conservative than this in recommending the Apple as a general-purpose bookkeeping system.

Slower Times

While the Apple II's time for the scientific/engineering problem was about average for the systems tested so far, its accounts receivable performance lagged behind — slowed, no doubt, by the diskette drives, which are required extensively in that problem. It is important to put this in perspective, though, because most Apple customers are first-time computer users. Since they are computerizing an application for the first time, the relative speed of one computer over another is insignificant compared to the difference between human and computer.

Instead, the determining factor in the low-cost systems is often software. Good software availability spells success, as in the case of Apple and Radio Shack's TRS-80, and poor software availability leads to difficulties such as have been reported by users of the Texas Instruments, Inc. 99/4. Many users of Apple and other low-end computers do not program at all; they simply plug in cartridges, tapes or diskettes and run the programs.

The marketing approach reminds one of competing videorecorders, each manufacturer hoping to offer more programs in its format and thus dominate the market.

Market Evolution

The current situation represents the third stage in an evolutionary process by which the home computer market developed and has spread upward into small business computing. Initially, the microprocessor-based systems were available in kit form or in hand-built ready-made hobby versions. The

SCOREBOX

System: Apple II
Current Price: \$4,270

Series 1 Results**** Systems up to \$15,000

	C-1 Scientific/- Engineering Time	C-3 Accounts Receivable Time
Pertec PCC 2000	28:48.4	6:04.3
North Star Horizon	12:01.9	1:57.7
Cromemco System Two	14:52.6	2:48.0
Texas Instruments 771	22:05.4	3:38.1
Vector Graphic System B	19:30.0	5:56.5
Decstation 78	22:35.6*	5:04.8*
Radio Shack TRS-80 Model II	20:00.7	3:38.6
Apple II	21:11.0	6:17.4

Series 2 Results**** Systems \$15,000 to \$25,000

	C-1	C-3
IBM 5110	29:47.2	4:11.0
Wang 2200VP	2:05.8	3:20.0
Texas Instruments FS990/10	**	3:18.6
Hewlett-Packard System 45	4:38.9	5:05.8
DEC PDP-11V03	14:43.4	4:14.0
Q1 Lite	6:50.7	5:03.3
Univac BC/7-610	12:09.2	10:37.0
Northern Telecom 405	**	**
Datapoint 1170	38:27.5	6:50.4
Randal 100	13:52.4	10:05.0
Hewlett-Packard 250	4:05.9	4:45.7
Texas Instruments DS990/2	**	2:48.3

*Results include both compile and run time.

**Test could not be run because of memory limitations.

***Test could not be run because of formatting limitations.

****Both Series 1 and Series 2 were run on the same programs.

This is the 22nd in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

purchasers then were likely to be electronics experts who could program and engineer their way out of the difficulties those early systems presented.

Later, mass-produced systems such as the Apple appeared, and the electronics expertise was no longer so important. A second group of users entered the market — those who could program small systems in a high-level language, but had little engineering experience.

Eventually, software became available for a variety of different applications, and the combination of reliable hardware and packaged software made owning a computer feasible for the average businessman or professional. For the first time, the inexpensive computer could be sold to people with no prior data processing experience whatsoever.

The new customers of small computers tend to fit one of two molds: users with primarily educational and home applications in mind, and those with

specific business applications, such as business financial planning or accounting, as the intended application.

Apple's Strong Applications

It is possible that many justify the expense of a starter system as a means of gaining experience with computers cheaply. These professionals may keep the system at home, keeping it for personal finances, games and their children's use. Eventually, they acquire enough knowledge about computers to make an intelligent purchase for business use.

Apple's "Dow Jones series" of personal finance programs is an excellent package for this type of user. It includes a news and quotes reporter program and a portfolio evaluator program. Both of these are used in conjunction with a time-sharing service to provide stock quotes and financial news.

Apples also find use in particular areas within some businesses. Using

the Visicalc program, part of the Decision Evaluator package, businessmen can explore financial forecasting at a low price tag. For larger planning efforts, Apple offers a Desktop/Plan program. Both of these can be combined with Apple Plot, a graphics display package.

Our survey of a small sample of Apple users, taken by the consulting firm that performs ACU's benchmark tests, revealed some dissatisfaction with the system's accounting package, called The Controller, and with after-sale support from the local dealer. But other users were quite satisfied overall.

Of seven contacted who had purchased the accounting package, four had negative comments about speed, adaptability and capacity of the system for their application.

Only a small percentage of the group surveyed were doing any programming in-house. Some were using the computer very little, because it had not turned out to be suitable for the task they had intended it for.

It seemed apparent that some of the Apple business customers had either been oversold on the performance of the machine or had not even inquired as to its suitability before purchase. Their experiences varied according to the level of support and guidance supplied by the vendor.

Even though the price tag on a microcomputer is lower than that of a more sophisticated system, the evaluation process should be the same. The customer must ensure that equipment and software purchased are adequate for the intended application.

About the Author

Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and many other foreign countries.

One of the association's key activities is the publication of its "Benchmark Reports." Each month a new 24-page report is produced covering another computer system.

In addition, ACU publishes seven bi-monthly newsletters for users of small computers, midi computers, large computers, time-sharing systems, distributed processing systems, word processing systems and home and hobbyist computers.

A complete package of information about the benefits of membership in the Association of Computer Users is available from the group through P.O. Box 9003, Boulder, Colo. 80301.

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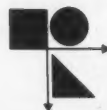
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Telidon: Canada's Experiment with Viewdata

What are the responsibilities of Canada's Department of Communications?

Our responsibilities range from radar research and a comprehensive general communications research program at one end to fiber optics and the Telidon program. That program originated in our lab, as a matter of fact.

Readers often see significant claims for Telidon even though, generally speaking, there is very little new technology involved. Does Telidon really differ from other viewdata experiments?

It's true that the technology of viewdata is not new. The whole concept was originated by the British with their Prestel [viewdata] and Oracle/Ceefax [teletext] systems.

The difference lies in the ways we store and transmit information. Earlier systems, such as Prestel or the French Antiope system, are "alpha-mosaic." That is, if you imagine the TV screen as divided into a finite number of squares, these are mapped into the computer memory with an exact one-to-one correspondence. To draw a line on a CRT with these systems, the appropriate squares are filled in with the necessary character.

Telidon, however, makes the display totally independent of the way in which data is stored or transmitted. [Early in our research] we were able to show that any picture can be represented with a finite, and small, number of "picture primitives" or "picture description instructions" — PDIs. There are eight of these, such as arcs, polygons, bits and so on.

What is the advantage of this approach?

It makes the display totally independent of the way data is stored or transmitted. Data bases can be accessed with displays having any desired resolution; the displays need not be conventional TV sets. In Telidon, drawing a line from one corner of the screen to the other involves transmitting the endpoint coordinates of the line. This is done by having a small microprocessor inside the terminal that interprets the [transmitted] instructions.

Does this give you any real advantage? Doesn't it simply add to the cost of the system without supplying any real benefits?

This approach is called an alpha-geometric system, and it is oriented towards producing good graphics. The graphics that appear on the screen are totally independent of the way data is stored, and the resolution obtained is always the best possible resolution the individual display can provide.

For example, we can handle any alphabet — Chinese, say — as well as script. Moreover, we can have overlays of one picture on top of another. Most important, we can handle motion, and all this can be done over a low bandwidth communications line.

In some ways this system sounds analogous to Telenet or Tymnet in that the communication aspect is separate from the data and a wide range of terminals can be accommodated.

Exactly. Our objective was to make the system independent of the display technology, since we expect that displays may improve with time and people's needs may change. However, you don't want to have to go back and rewrite the data base every time the display is changed.

We didn't necessarily design this system with the Telenet model in mind, although we had been doing extensive work in packet-switching. Canada, as a matter of fact, was one of the major participants in the development of the packet-switching standard, and our lab is pretty conversant, of course, with these technologies.

How, then, did Telidon come about?

Telidon was not [originally] intended for viewdata at all; we had been looking for ways of carrying on pictorial or graphical conferencing over the phone.

The British Prestel system had roughly 5,500 subscribers as of last September, despite the fact that they've been in business for more than two years. Are the British beating a dead horse?

I think they are. The only problem, of course, is that they've spent so much money in this particular technology it would be very difficult for them to switch. Because they were very early with it, they used a fairly primitive, brute-force approach to the technology. It wasn't up to scratch, and my personal view is that they will probably

(Continued on Page 52)



Douglas F. Parkhill is Assistant Deputy Minister (Research) for the Canadian Department of Communications, Canada's largest government communications research and development activity.

Since his appointment in 1974, Parkhill has led many major policy and technical activities concerned with communications satellites, computer/communications systems, command and control systems and telecommunications. It was under his general direction that Telidon, the Canadian viewdata system, was developed, and he still maintains responsibility for that system.

Parkhill has published widely and is the author of *The Challenge of the Computer Utility*, which was a 1966 winner of the McKinsey Award for an outstanding contribution to management literature. More recently he edited a book called *Gutenberg 2* about viewdata experiments and electronic publishing. He holds a B.S. degree in electrical engineering from the University of Toronto and an honorary doctorate in engineering from the University of Ottawa.

Before taking his present position, Parkhill was Assistant Deputy Minister (Planning). He joined the Department of Communications in 1969 from the Mitre Corp., Bedford, Mass., where he was head of the Satellite Communications Department. He has also held engineering positions with General Dynamics Corp., Avco Corp. and Computing Devices of Canada.

Parkhill was interviewed for *Computerworld* by free-lance computer journalist Howard Karten.

IN DEPTH

(Continued from Page 51)
bly suffer the consequences.

I envy them the enormous resources they've put into marketing and developing their system, and we owe them a debt of gratitude for pioneering this to bring it to public attention.

[We also are indebted to them] for establishing the basic principles for the operation of a public system and for the idea of separating those who provide the information from those who distribute it.

What about the number of subscribers — isn't it rather small given the amount of resources that have gone into the system?

It's amazingly small. I'm continuously astounded by it [laughs]. I guess people can draw their own conclusions from it, and it's not up to me to do that. But it does indicate that something is radically wrong either with the

technology [itself] or with the way it is being exploited.

Similarly, the service of Source Telecommunications Corp. (The Source) reportedly has a large number of subscribers as well as electronic mail, but it still appears to have financial problems.

Does this suggest that perhaps people are still not ready for general-purpose computerized information retrieval systems?

I think that's very true. It's interesting that you used the term "information retrieval" because information retrieval is the area that's received the greatest attention, and at the moment most experiments are devoted to that.

However, videotex is really much broader than [merely] information retrieval. The Telidon set in my office, in addition to being an excellent means of retrieving information from a data base, is also an excellent communicator. It provides, almost as a zero-cost by-product, a telemail system. Moreover, it provides a true interactive transaction system, such as [for] buying goods from a retailer. All these interactive aspects are probably just as important — if not more so — than a pure information retrieval model.

Information retrieval will also have competition [soon] from video disks. The question is, how much information [need be] permanent and how much requires [periodic] updating? The transitory portion could be supplied via videotex or even teletext.

Recent data has shown that the best-selling items in video software are pornographic tapes, which . . .

[Hearty laughter] Maybe there's a future for Telidon in pornographic cartoons, in that case!

. . . which suggests that many of the very optimistic forecasts made for information retrieval may be off base.

If you say just information retrieval, then I think the answer is yes. But when you couple together [all the possibilities] into a single, versatile unit, you get the possibility of accomplishing a variety of things, to retrieve instantaneously — to any degree of depth you want — the information you need.

Suppose, for example, you're repairing your car at home. You could call up the necessary manual on the screen and turn the page to it electronically. Step by step, you could go through your repair. If you got in trouble, you could immediately address another data base or another section of the manual and get assistance.

That is where the graphical capabilities of Telidon are so important, [especially] in comparison to Prestel. With Telidon you can get good, high-quality pictures that can do even more. For example, if it is valves you want to adjust, you can get a slow-motion picture of how they should open and shut and what you should do to adjust them.

Even in that case, wouldn't you still be limited by the resolution of the TV picture?

You can get any resolution you're willing to pay for in the display; it doesn't have to be a conventional TV set. We use them at the moment because they're available, but in the future I can imagine the "home information center" where people might start

(Continued on Page 56)

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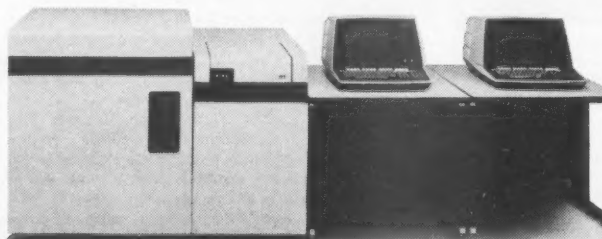
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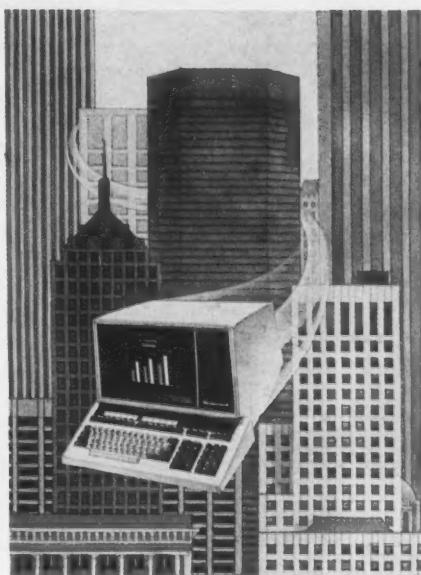
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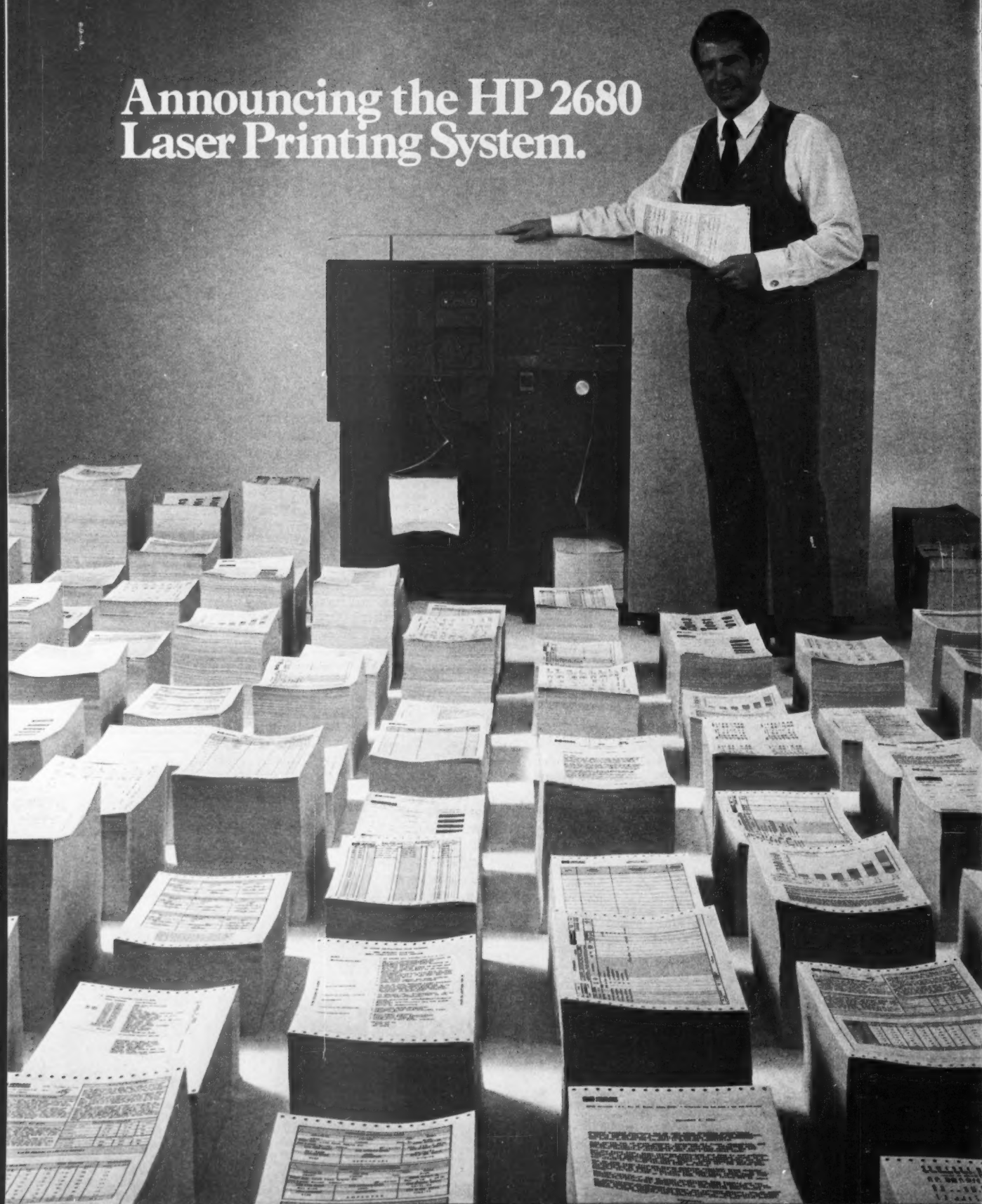
You'll find DPS 6 systems easy to install and easy to maintain. Best of all, they're so easy to expand you won't have to worry about growing too fast. Their built-in expansion capability means they'll keep on working—doing the future applications you haven't even dreamed of yet.

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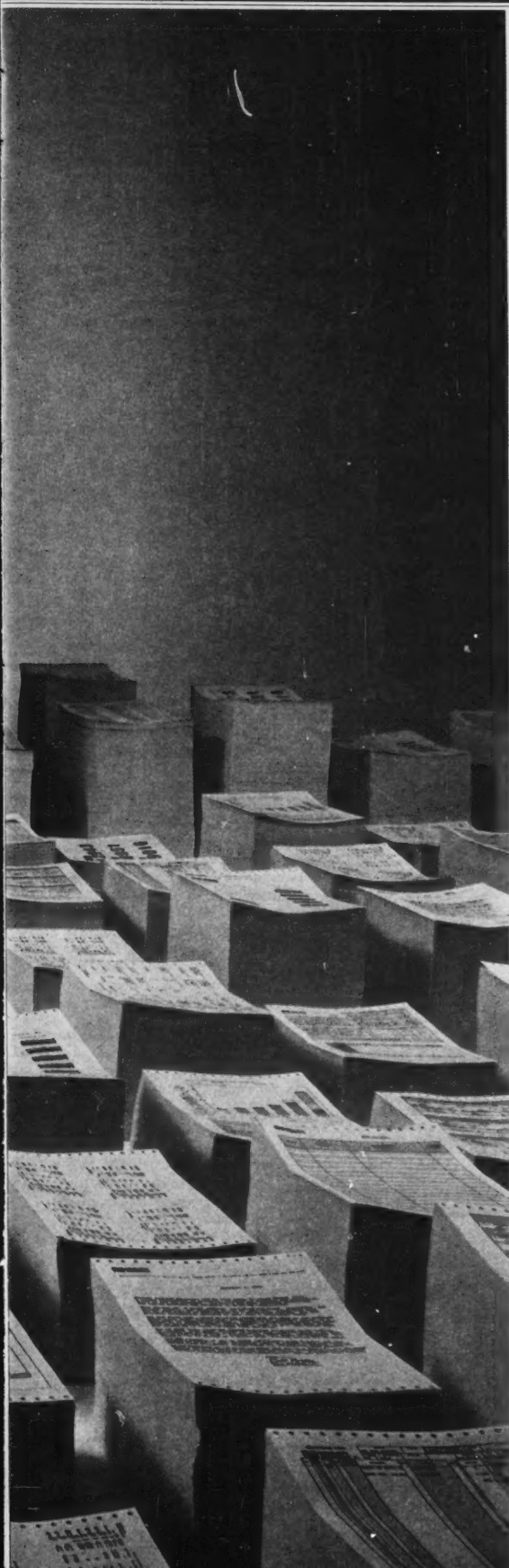
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**HEWLETT
PACKARD**

IN DEPTH

(Continued from Page 52)

out with a conventional TV set and upgrade it later [similar to the trading up that occurs in the hi fi/stereo market].

Do you believe, then, that viewdata-type systems that deal only with alphanumeric information are doomed to failure if they don't include some of these other capabilities?

I believe so. I think we live in a soci-

ety that has grown used to a fairly high-quality picture. Most people will very rapidly tire of [viewdata] if all they can get on a TV screen is alphanumeric information and some rudimentary graphics. On the other hand, if you provide this versatility and the possibilities of growth so that when people do tire [of the old technology] they can trade up, then [these systems will be viable].

Where will viewdata be in five or 10

years?

In 10 years I believe we'll [achieve] the old dream we've had since time-sharing [came about] of terminals becoming as pervasive and commonplace as the telephone of today. I'm certain that will happen by 1990.

By 1985 — and here I'm mostly quoting the consensus of market surveys — we'll find the beginning of the explosive growth of these home information services, corresponding to the explo-

sive growth that took place in color TVs during the '60s.

Some have suggested that viewdata is a service or an idea which is being "sold" by entrepreneurs rather than "bought" by subscribers. Do you have any comment?

Look at the environment in which it operates. If you're going to have a viewdata industry, you're really talking about a system with many different elements, all of which have to be in place and all of which have to be functioning before anything can happen or before anyone can make a buck on it.

You have to have the hardware manufacturers producing equipment at a reasonable price and of the necessary quality, for example. There are home terminals, office terminals, information provider terminals — a whole range of possibilities.

There also have to be changes in the cable or phone system to distribute the information.

For example, in New York City today, 100,000 subscribers in a given telephone exchange, all trying to access a particular program, would totally paralyze the New York City telephone network. So we need dramatic changes there — and even greater changes in cable.

And we need to create the industry that provides the content. This is a whole new art form. It's a matter of not just duplicating what exists in the print media onto a flickering electronic picture, but taking advantage of the best of print, the best of graphic arts, the best of computer technology and creating a whole new medium. This is why government has to be involved — to coordinate the whole industry. In Europe, with the PTTs [the postal, telephone and telegraph authorities], the carriers and the government are one and the same, so it's relatively easy.

In Canada, the approach we've taken is to use the government as the catalyst. The technology happened to develop in a government lab, but it could just as easily have been in a private lab. The government recognized this, and we went to industry and set up a shared program administered by the Canadian Videotext Consultative Committee. This is a body of 30 leaders drawn from the carrier industries, broadcasters, manufacturers, information providers, cable companies and the consumer's association. We have spun off a number of voluntary private committees. You need that kind of network or coordinated government-industry cooperation which other countries have historically done very well, countries such as Japan.

The Federal Communications Commission lately has been deregulating the U.S. telephone industry. What observations do you have on those actions?

I'm not familiar enough with the details to make my comments worth very much ... The model that I think all



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IN DEPTH

countries should agree on is one that ensures that the producers of information have unrestricted access to the distribution system. That means that the distributor — the carrier, whether regulated or not — must be forbidden from having anything to do with the content.

We're dealing here with the possible replacement, or supplement, to the normal press, and if you permit any monopoly organization to say what will be transmitted over its network, then freedom is in a very difficult situation.

Speaking of changes in the telephone industry, what do you see as the major technological changes of the future in this area?

If we went to a full digital system with packet-switching techniques, the overload problem vanishes. Right now a phone call means a physical connection between two phones, and that circuit can [then] be used by no one else — even though the actual use we're making of that line [in conversation] is at a fairly low rate. With an all-digital system, you can multiplex many conversations over the same phone line or switch.

It will probably be the turn of the century before this occurs, but it's got to be done. Almost any telephone engineer these days will tell you that. To carry that digitization right through to the subscriber's phone is a longer term process, but it's got to happen.

There are other developments, too. Fiber optics will transform the whole picture by the turn of the century. With fiber optics as the local loop to the home [i.e., the interface between the subscriber and the network] you've got a channel with the ability to handle many picture channels, and that has all sorts of implications.

What about the cost factor? Is fiber optics cost-competitive with copper?

It's cost-competitive with copper today. In the province of Saskatchewan, for example, it is competitive for long-haul usage. They're engaged now in connecting all communities over 300 population with fiber optics; that one system will use as much fiber as has been produced in the world to date, and [the impact of that move] is already being felt in driving down prices.

That's probably the largest [effort] in the world to date, but I'm sure it will shortly be followed by similar efforts in other countries, including the U.S. Certainly most people feel that by 1985, for almost all applications you want to think about, fiber will be almost as cheap as copper.

Viewdata may open up new legal issues. Do you see, for example, a significant privacy issue here in terms of the government's knowing who accessed what information?

Yes, that's a *real* danger. [Clearly] if you're going to bill for information received, someone has to know in considerable detail who accessed what, for how long and all the rest. One solution to that is for the operators of the billing system to be bonded professionals and that there be criminal penalties for unauthorized release of the information.

The answer involves the whole privacy issue, and my feelings on that are pretty strong. For example, I'd like to

see a ruling saying that for a person named in a data bank, the named person is the real owner of the data — and that only he or she can decide who it is given to, and that if there is a breach of security, the person breaching it be subject to not only civil suit or slaps on the hand by fine, but also to mandatory jail sentences.

If you make the penalty severe enough, it can certainly alleviate, if not eliminate, the significance of the problem.

Do you have any pet applications in mind for viewdata?

One, announced recently in Canada, is its use in providing access by people to government data under Canada's Freedom of Information act.

Under that program, we'll have terminals in public places across Canada this year. We hope to have the first such installations operational by this April or May.



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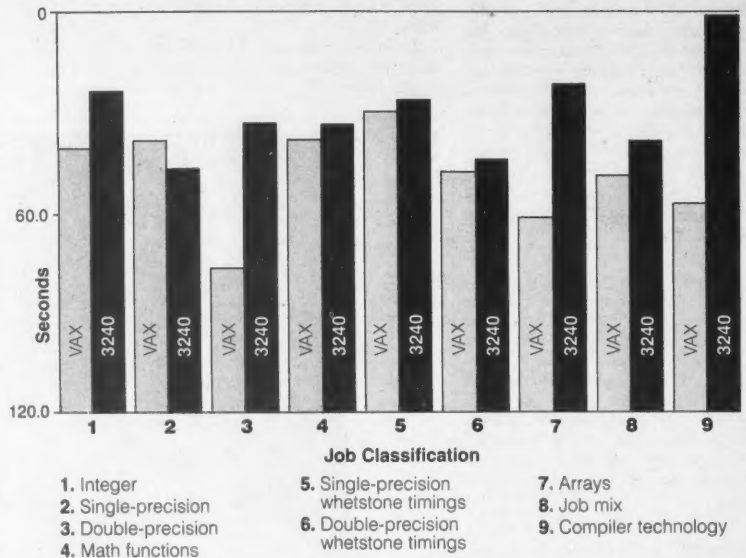
MEGA

1. Performance Measurements

Benchmark Name	VAX 11/780 CPU time	Perkin-Elmer 3240 CPU time	Performance Ratio*
PMS0154	1.140	0.907	1.26
PMS0254	4.710	4.485	1.05
PMS0354	9.160	8.990	1.02
PMS0454	43.610	43.451	1.00
PMS0554	86.420	86.123	1.00
PMS0664	1.610	1.350	1.19
PMS0764	7.040	6.679	1.05
PMS0864	13.730	13.370	1.03
PMS0964	66.830	66.068	1.01
PMS1064	132.920	129.727	1.02
PMS1124	1.520	1.306	1.16
PMS1234	2.470	2.424	1.02
PMS1324	1.310	1.618	0.81
PMS1407	251.560	37.327	6.74
PMS1507	50.260	57.657	0.87
PMS1674	22.440	23.005	0.98
PMS1724	52.550	53.133	0.99
PMS1807	50.180	34.766	1.44
PMS1907	32.020	34.679	0.92
PMS2007	17.720	20.264	0.87
PMS2107	13.450	20.242	0.66
PMS2202	33.311	26.352	1.26
PMS2324	121.610	137.997	0.88
PMS2402	0.940	0.539	1.74
PMS2502	0.720	0.562	1.28
PMS2624	122.920	227.689	0.54
PMS2708	4.850	0.961	5.05
PMS2809	103.770	0.006	17295.00
PMS2934	0.660	0.414	1.59
PMS3009	0.230	0.006	38.33
PMS3103	0.610	0.398	1.53
PMS3202	4.740	3.923	1.21
PMS3307	2.470	1.959	1.26
PMS3407	39.190	7.774	5.04
PMS3507	5.580	2.587	2.16
PMS3607	156.540	20.077	7.80
PMS3701	4.480	1.621	2.76
PMS3802	4.060	2.874	1.41
PMS3903	6.050	3.864	1.57
PMS4002	9.330	5.505	1.69
PMS4102	76.290	77.764	0.98
PMS4202	118.490	125.039	0.95
PMS4301	110.650	75.569	1.46
PMS4403	1.990	0.739	2.69
PMS4584	219.990	189.081	1.16
PMS4603	18.640	16.939	1.10
PMS4701	0.350	0.077	4.55
PMS4802	0.830	0.880	0.94
PMS4934	0.340	0.050	6.80
PMS5008	0.430	0.168	2.56
PMS5108	98.950	55.419	1.79
PMS5208	0.900	0.917	0.98
PMS5308	0.330	0.029	11.38
PMS5408	2.080	1.697	1.23
PMS5502	1.130	2.180	0.52
PMS5602	207.140	198.685	1.04
PMS5703	585.170	254.545	2.30
PMS5824	18.740	18.194	1.03

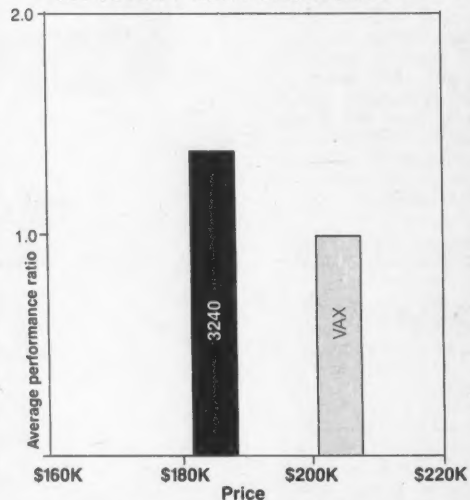
*Performance Ratio = VAX 11/780 CPU time
Perkin-Elmer 3240 CPU time

2. Perkin-Elmer 3240 vs. VAX* Average Time by Job Classification



*VAX is a trademark of Digital Equipment Corporation.

3. Proven Price/Performance



The configurations tested were 2 MB of memory, 67 MB disc, 75 ips tape, Floating Point Processor, CRT terminal, battery backup, and system software. The 3240 had a Writeable Control Store and Fortran Enhancement Package, while the VAX 11/780 had a Floating Point Accelerator.

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our customers and prospects reflecting their application needs. Applications that deal with the same kind of problems you face every day.

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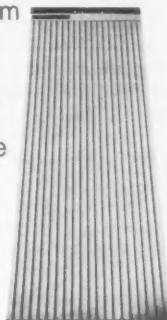
In Table 2, we organized the benchmark results into nine common types of job classification, so you can see at a glance how the 3240 stacks up vs. VAX 11/780. (The ninth classification demonstrates the superiority of Perkin-Elmer's system software, in this case globally optimizing FORTRAN VII.)

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EDITORIAL

IBM and X.21, X.25

With every major data communications conference, IBM seems to move closer to committing itself to domestic support for the X.21 and X.25 de facto standards for interfacing data terminal equipment to public packet networks.

At several conferences last year, IBM Chief Scientist Lewis M. Branscomb proclaimed the vendor's "enthusiasm" for the International Standards Organization's (ISO) efforts to develop an Open Systems Interconnection reference model, an architecture incompatible with IBM's Systems Network Architecture (SNA). The first three layers of the ISO model contain X.21 and X.25.

But Branscomb said IBM would wait for Bell and the other major carriers to honor those standards before incorporating them in product lines. This withholding of support tends to hurt users with international branch offices or correspondents more than other users because the X.21/X.25 standards are met overseas. But withholding also dulls the effectiveness of domestic links to the X.25-based public packet networks of North America.

At a recent conference, the president of IBM's System Communications Division, Allen J. Krowe, told *Computerworld* that IBM has pledged support for X.25 in products scheduled for shipment to the Federal Reserve System, which is upgrading computer facilities that drive electronic funds transfers. The nation will bank on X.25, the man directing the Fed's upgrade told CW last year.

Since software resident in IBM's 3705 communications controller is a currently favored approach to forging a bridge between X.25 and SNA, it will be interesting to see whether IBM will put X.25 compatibility in the 3705 replacement rumored to appear a few months from now.

Good Enough?

By the time you read this, Super Bowl XV will be history and computer prognosticator Bud Goode will know whether his Fortran program on a Univac 1106 mainframe was right to pick the Philadelphia Eagles over the Oakland Raiders for the National Football League championship.

At press time, the game looks to be close — with many variables for Goode's software to process at the Sperry Univac Data Center in Los Angeles [CW, Jan. 19]. Since computer models of human behavior are taken so seriously these days, the Super Bowl prediction seems an appropriate point to begin discussion of whether such models deserve the attention they get.

The most recent Nobel Prize for economics went to a pioneer in applying computer technology to economic forecasting, and such models command much attention in a world with prime interest rates greater than 20% per annum.

All this considered, the Super Bowl Fortran package had better be good to account for the prowess of the maverick Oakland Raiders receiver lest people begin to value such DP products in the same class as strewn tea leaves, crystal balls and the Council on Wage and Price Stability.

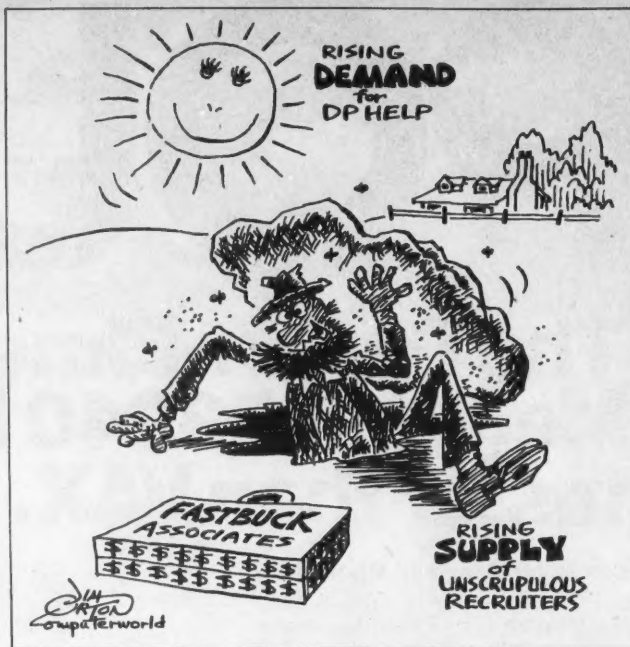
DATA PAST

Five Years Ago
Jan. 26, 1981

BALTIMORE — While President Gerald R. Ford told Congress and the nation that Social Security taxes would have to go up in the coming year, the Social Security Administration (SSA) went ahead with plans to build a \$69 million computer facility it wasn't going to need, a computer specialist with the SSA's DP operation charged here.

Ten Years Ago
Jan. 27, 1971

NEW YORK — The standard lease contract requirement of "maintenance by manufacturer" was eliminated by four major leasing companies, liberating some 500 users from single-source maintenance. The companies agreed to permit an independent maintenance company, Comma Corp., to service their customers.



Economics 81

LETTERS

Check Them Out

"Kickbacks, Gifts and Sex" [CW, Jan. 12] was totally negative and offered no positive input to readers on how to avoid unethical agencies. It is just as important for an applicant to check the references and reputation of an agency as it is for the client company to check references on the applicant.

As for false advertising (advertising nonexistent positions) and use of client company names to confuse the readers, the fault lies with the State Department of Labor, Massachusetts, at least has fairly strict laws governing agency advertising and practices. Failure to have the position openings that are advertised, deceptive use of client names or failure to make clear that the ad is run by an agency can result in stiff fines or even loss of license.

Any applicant who accepts a job without taking the initiative to thoroughly check out the financial status, stability and future plans of the hiring company deserves whatever happens to him. Prior to interviewing, the applicant should have researched the company, its products and services and all available financial reports, both for his own knowledge and to show the interviewer more than passive interest in the company.

There are also very simple methods to protect the applicant from becoming a casualty in agency wars. A competent agency can instruct the applicant in certain procedures to avoid any possibility of slander or losing the offer.

Until the Department of Labor in each state cracks down on unethical agency practices, it is up to the applicant to aggressively seek out those of us who do enjoy good, professional reputations.

Barbara Verity
Management Consultant

Gray and Steele Associates, Inc.
Boston, Mass.

Making Matters Worse

In his letter [CW, Jan. 12], reader Martin Coke missed my point, admittedly not well made. In principle, I agree with his premise that organizations of like people serve the purpose of mutual support and education of their members. For that reason I belong to several computer and management groups and find them useful.

What I was trying to say was that organizations whose very titles reflect racial or sexual segregation policies are offensive to me because they apparently support these philosophies by their existence.

But if indeed these groups purport to solve their members' problems related to bigotry, they have assumed a hopeless task. I do not think there is anything you can do about people who cannot deal with blacks, women or what-have-yous for the simple reason that the problem lies with the dealers rather than the dealers.

That being the case, these organizations may be making matters worse by calling attention to themselves. In my opinion, if women and blacks and Martians would stop rubbing everyone's nose in the fact that they are those things, people would eventually forget about what they are and concern themselves with who they are. Then the problems would just go away.

(P.S. I am one of the above.)

E.G. Johnston
Westminster, Md.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

READER COMMENTARY/Thomas C. Jaycox

Some Predictions The Pundits Skipped

After reading *Computerworld's* first issue of 1981 and predictions as to what we may expect in the next decade in the way of new computer technology, I was somewhat disappointed. Aside from discussing whether the new IBM 3081 or H series will be recognized as the fourth-generation computer and predicting that we may have to wait another two to three years yet to find out, no one seemed to want to risk making any predictions of substance. The same was true about predicting whether data base machines would replace today's data base software technology.

This may, of course, be because so little of what was predicted for the decade just past actually came true.

I, therefore, am going to make the following off-the-wall, mind-boggling predictions of what we may expect in the next decade, without any regard whatsoever to the risk of being humiliated 10 years hence by being exposed as another nut who did not know whereof he spoke.

Plasma Technology

1. The plasma screen will replace the traditional CRT for display of most textual and graphic (up to 1,024 by 1,024 resolution) information, including color displays. The plasma (flat) screen technology with touch-screen and rear image projection features will finally catch and then surpass the traditional CRT in both price and performance categories.

Display terminals, such as the plasma, will minimize keyboard entry (maybe eliminate it altogether), creating increasing user appeal and accep-

ance. The ability to obtain information, in both text and graphics form, by merely touching any item of interest on a formatted screen menu (as well as enter data of interest in a similar manner) will greatly reduce the need for typing skills, as well as minimize the number of errors inherent in keyboard entry.

In addition, the rear projection features of the plasma screen technology will add yet another dimension to the terminals of the future. The ability to project images from 35 mm slide or microfiche (and eventually motion picture film or videotape) onto a screen that can also contain computer-generated text and graphics will completely overshadow the present display characteristics of the CRT.

Whether the information you are seeking has to do with a person, place or thing, no longer need you be satisfied with a narrative description only or with limited graphics representations. For example, if you'd like to see a picture of the person that corresponds to the resume or skills profile appearing on the screen, it is yours. If a detective would like to see the mug shot or fingerprint record of a corresponding suspect's description appearing on the screen, he's got it. If the potential home buyer wants to see pictures (both interior and exterior) corresponding to the description appearing on the screen, there it is. If an engineer wants to see a picture of a drawing, a printed circuit board or a factory layout, it's his for the asking.

Most, if not all this information (including pictures) will be obtained by

(Continued on Page 65)

THE TAYLOR REPORT/Alan Taylor

New Systems Could Prove Boon for Teamwork

Imagine a department manager's display that provides simultaneous monitoring controls on departmental actions and progress as well as processing and evaluations of current and hypothetical situations. And, imagine that it keeps the manager informed about the content of mail sent just seconds before by other management team members, while also giving him the time and space to keep diaries, reminding him of appointments, helping him watch budgets and suggesting personal income tax opportunities!

Imagine a firm with such team management capabilities available to its department heads, both line and staff, allowing them to access hundreds of data items from the DP files simultaneously as the occasion arises.

These services are rather different from those usually provided today and could change the operation of management teams rather considerably.

"Team computers" of this nature are coming, and Apollo Computers, Inc., a firm not yet one year old, has demonstrated the possibilities with its first product.

The Apollo computer almost requires the use of techniques that are as dissimilar from today's methods as interactive processing is from batch. And those techniques, notably ring architecture and multiple concurrent-node processing, add up to a new way of using computers that is particularly suitable for corporate management teams as well as the research and development teams for which the system is currently geared.

Consider a management team consisting of a production manager, a marketing manager, a finance manager

and a personnel manager. Suppose each manager has one of the Apollo nodes and that another node is occupied by a DP management staff assistant who has been able to produce and maintain all the appropriate programs.

Independent Operations

Under Apollo, each office could control its operations on as many terminals as necessary, with the terminals specialized for particular functions, including departmental supervisory ones. The order department would continue to operate just as it formerly had, bringing in orders, answering delivery queries, doing credit checks and so on.

Manufacturing would use its terminals for creating production orders, ensuring materials were on hand and doing the many related, detailed tasks; similarly, the other departments would go about their independent tasks, much as they had. At this level, no change would be evident.

The departments might even retain some of their old hardware, software and application systems, although they would be logically slaved off or connected to the Apollo ring connecting the team members.

With the system, the operational method of the team would be the most important difference.

Team-Member Operation

In finance, for instance, the financial team member could have some eight or 16 programs running concurrently — not just two or three. And this capability is based on the system's current stage of development; by the time it is

(Continued on Page 66)

HUMAN CONNECTION/Jack Stone

Beware of Personnel Documentation Standards

When we DPer's talk of the burden of documentation, we almost always refer to the writings on systems design and implementation matters and rarely discuss other documentation required of the computer center, such as mission statements, job descriptions and performance appraisals.

Many of us appreciate that these materials represent a large data base that requires a considerable expenditure of resources for its generation and maintenance. But they are essential for proper personnel administration and are needed in the computer center now more than ever; what's worse, computer center management is responsible for ensuring that this material is — to coin a phrase — complete, accurate and timely. Sometimes, though, this documentation support effort can become burdensome, if not awesome, and DP management is well-advised to make sure it doesn't get out of hand, as it did in the case of a recent client of mine.

For many months now, I have been involved as a consultant in a comprehensive reorganization of an end-user department within a very large firm.

The firm's project manager originally asked me to review and evaluate the effectiveness of departmental information system support as part of the effort; however, after he discovered that I possessed a portable word processor plus a modest way with words, my machine and my verbosity were quickly tossed into the process of generating new organization documentation for the department.

Because this material will be used later as a model to upgrade the documentation for other operating departments, including the computer center, I thought that my experience could be useful to computer center managers who may be facing a similar problem (and do not wish to lose their sanity altogether in solving it.)

To his credit, my project manager was determined to do the job right and insisted on an accurate, well-written set of mission statements, plus job descriptions for current positions and new ones to round out career ladders for all job classifications. This was wonderful, until I saw that the documentation standards required infinitely detailed mission statements and

even more detail for each job description (although, to be sure, the job description includes performance measurement factors).

To give you a perspective on the size of the task, there were nearly 100 job descriptions to be prepared, and the one for the lowest grade secretary was six single-spaced typewritten pages, or about 2,500 words. So when I began the work, I found myself facing (somewhat catatonically) the prospect of generating nearly 250,000 words within only a few months' time! (It nearly drove me up a wall, but the job was done on time.)

Ridiculous Standards

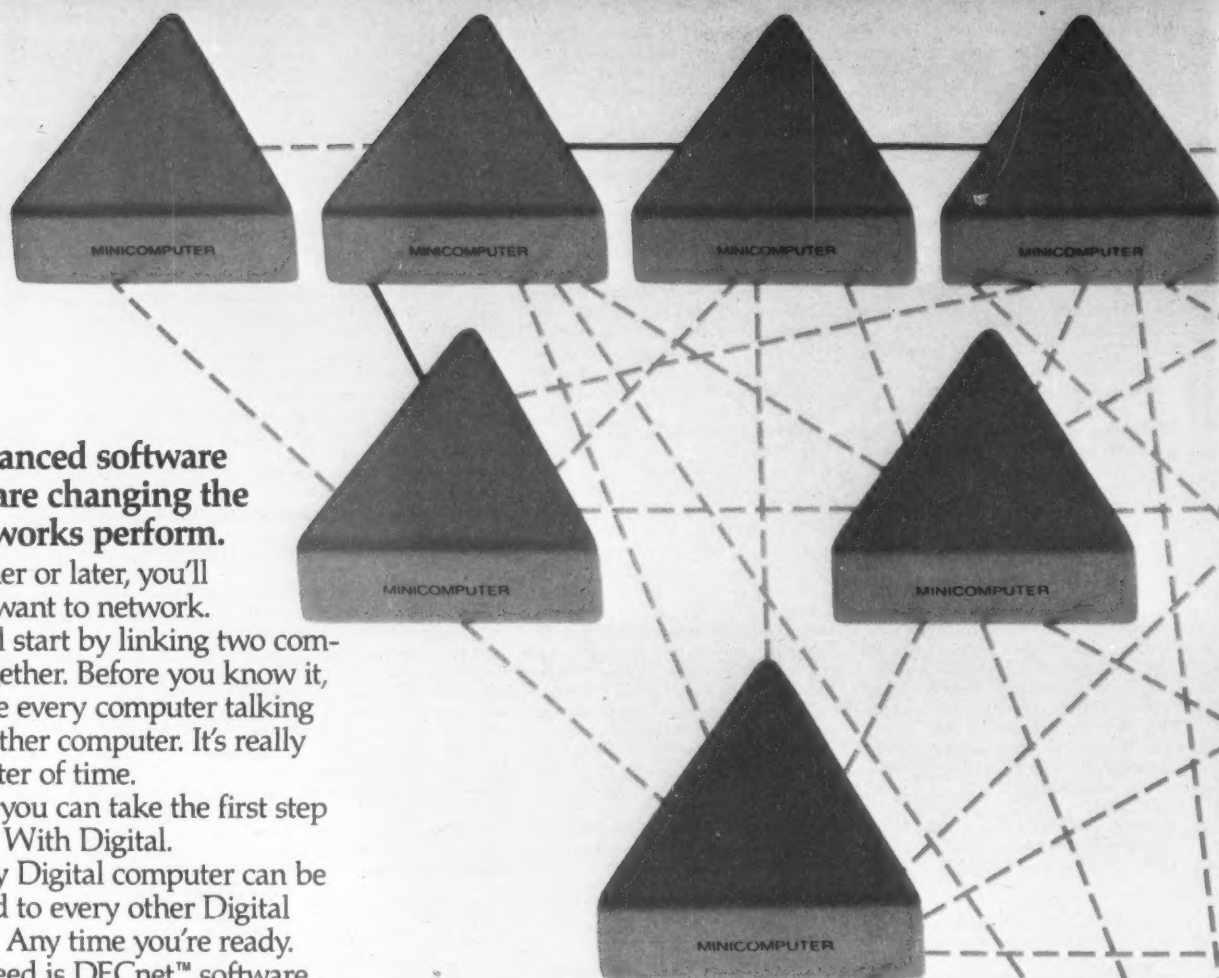
One doesn't have to be the dean of the Harvard School of Business to figure out that the documentation standards for this operation are patently ridiculous. The continuing and massive efforts involved in maintaining the material will be bad enough, but then I have grave concerns that the incumbents can even come close to fulfilling the job specifications (or, in some cases, even understanding them).

But this task is peanuts compared with the one I'm facing now. The project manager wants key job factors identified and five levels of performance standards constructed for each factor — which translates into 25 items for each job description, about 2,500 in all!

Of course, the real losers under these circumstances are not the managers, who probably will find enough excuses to delay the personnel documentation nightmare indefinitely, nor the consultants who, after all, are paid for their efforts (maybe not enough for my current task). The losers are the employees who are forced to work hard and long, knowing full well that there is no complete agreement as to 1) what they are really supposed to be doing (other than daily assignments), 2) how their performance is to be measured and 3) how the job descriptions and performance appraisals can be handled simply and effectively.

As we are finding out the hard and expensive way, salaries alone will not keep skilled DPer's on board under such meager personnel management circumstances.

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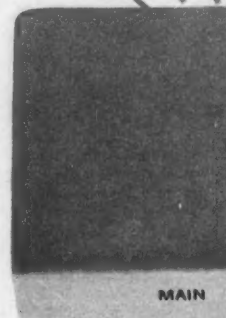
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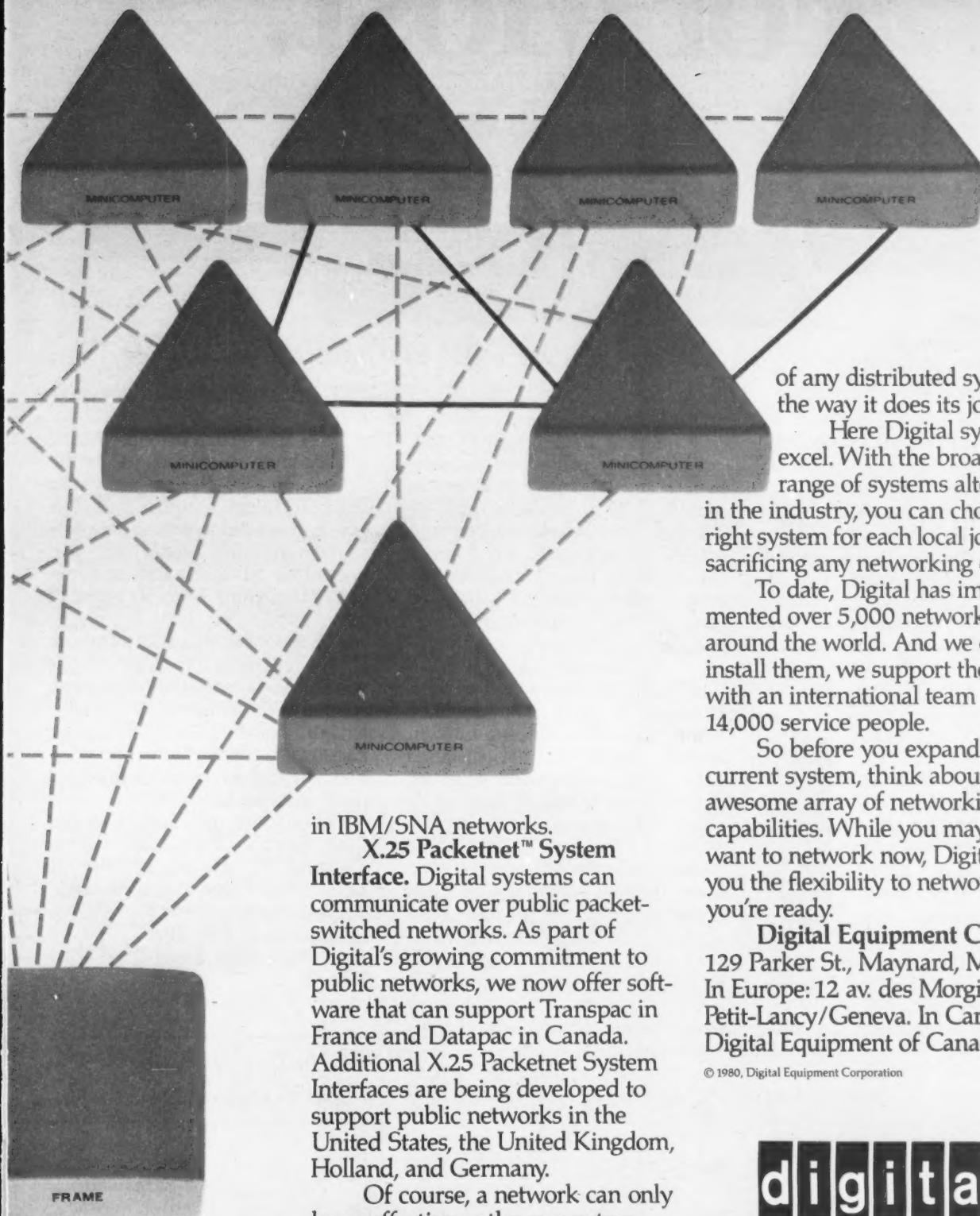
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in IBM/SNA networks.

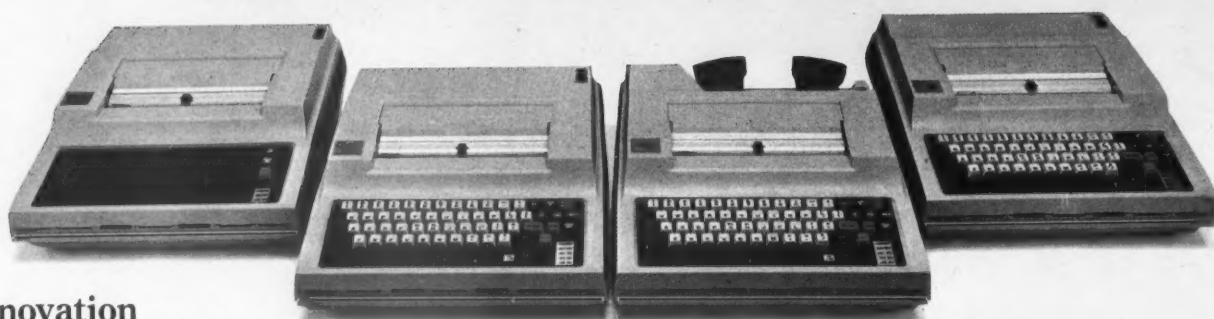
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Algorithm Not Useless

In reference to Hanley Strappman's letter [CW, Dec. 29-Jan. 5], the algorithm for packing five characters in a 24-bit word is *not* useless. It was, in fact, used to store account passwords in ComShare's "W" series systems on the XDS 940 in the early '60s.

The object? Security. A system "browser" who bypassed other safeguards to achieve a "dump" found nothing that looked like ASCII character passwords.

Barry Paulson

Galesburg, Ill.

Too Restricted

Once again, *Computerworld* and Datapro Research Corp. have pulled off an excellent survey [CW, Dec. 22].

However, I noticed something this year I had apparently missed — or rather, not missed — before. The subject was really rather restricted. Missing from the survey were such popular and important software products as Fortran, Lisp, Plato, Coursewriter and

Nastran. (Sorry if I left out anyone's favorite.)

Or is it possible I'm the only subscriber in a nonbusiness field?

Doug Pearson

Mountain View, Calif.

Using a VDP 1000?

I would like to hear from other users of Lear Siegler, Inc. VDP 1000 computers, using the VMOS operating system and Basic language.

I am the only user in South Africa and would like to exchange experiences.

My address is 24 Douglas Road, Bedfordview 2008, South Africa.

C.L. Kidson

Bedfordview, South Africa

Measure Results

I just finished reading the Human

LETTERS

Connection article by Jack Stone entitled "How Good Is Your Personnel Appraisal?" [CW, Dec. 29-Jan. 5].

I agree with the majority of the article except for Stone's statements that personnel appraisals can never be totally objective and that performance standards should include subjective factors.

It is well known that throughout the industry a well-defined and objective individual performance measurement technique is lacking. It must be realized that one of the most important assets in any organization are its people. Why is it, then, that most employees are faced with one person's subjective opinion when their performance levels are determined? This subjectiveness, in most cases, is unfair to the employee and can affect on his compensation.

All of us, at one time or another, have sat down with our superiors at review time and disagreed on some area of the

I would like to take Stone's article one step further in detail. For measurement purposes, I feel that emphasis should be placed on the result rather than the process. My feeling is that results should be measured for performance. This philosophy is very consistent with all objectives. For example, a corporate objective, to earn profits, can best be measured by identifying the profits rather than how the profits were made. Another example: If you tell a programmer to write a program that will list a name and address file in alphabetical order and you need it by Friday, what difference does it make what language it is written in as long as you get what you want by Friday?

In summary, there is no room for subjectiveness in personnel appraisals. If it cannot be measured, it cannot be managed or controlled.

As a DP manager, I have developed a fool-proof individual objective measurement system for my subordinates and would be happy to share it with others at their request.

Wayne Whiteside

Fremont, Calif.

More Predictions on Next Decade

(Continued from Page 61)

merely touching the screen to direct the computer to search out, retrieve and display that information.

As for Data Base . . .

2. My second prediction is that data base technology, as we know it today, will not even exist 10 years from now. The failure of data base systems in the past decade (owing mostly to their complexity) coupled with the ever-increasing size and decreasing costs of core memory and a continued proliferation of distributed processing systems (both mini and micro), will completely negate the need that existed 10 years ago. At that time, memory had to be conserved through better file organization and minimal data redundancy. That would, in turn, bring about faster response times.

Even today, a properly coded application program, under a high priority (but not necessarily the highest), running in the batch mode with output directed back to the user terminal can often beat the response time of the most sophisticated on-line, interactive data base system.

Don't get me wrong — there will still be a need for data base systems 10 years from now, but they will be completely different from those we know today.

In the Home

3. My third and final prediction has to do with more and more home computer usage in the next decade. Not only will you be playing games, keeping your household budget, doing your shopping, banking and bill-paying by home computer, but you will also be getting the latest news, stock market quotes and weather reports the same way.

The home computer will be regulating all appliances, as well as heating and lighting to conserve energy. It will also protect your home from fire or crime via interface to the local fire and police departments. If this were not enough, you will also be competing on TV game shows like "Family Feud" and "Let's Make a Deal" from the comfort of your own home. You may also play bridge, pinochle, chess or

checkers with people on the other side of the country.

And at the end of a hard day's work, you can come home, fix yourself a martini, sit in your recliner and lower a microphone-equipped helmet over your head. Then, when the voice coming over the headset asks who are you, you respond with, "I am Captain Kirk of the Starship Enterprise. What is my mission?"

You are given a mission to proceed immediately to the Cosmos Galaxy and engage a fleet of 27 enemy Klingons that are fast approaching the federation for purposes of destroying it. With the signaling of your acceptance of the mission, you are immediately transported (via sight and sound) from the reality of your den into outer space.

The preceding predictions are the type I like to read about as regards computer technology in the coming

decade.

Jaycox is a systems analyst for Boeing Computer Services Co. in Seattle.

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Honeywell

Systems Could Prove Boon for Teamwork

(Continued from Page 61)

prepared for the business world, this number may be greatly increased.

These programs would include routine ones that would probably never be turned off. Some of these would handle a further level of supervision of the department work, producing periodic totals, comparisons with forecasts and so forth.

In Apollo terminology, these programs would be kept on as an "Object" and would be available for use by any of the other programs, by any appropriate team member.

They could also be "windowed." In Apollo terminology, a window is any area of what we would normally call a file. The output of a process, an invoice, the time of day, the status of

some variable or a graphic display can all be called windows.

These windows can each be placed on a "pad" that has the same dimensions as the display output and control area. The difference now is that the information has a defined position on the display and defined display characteristics. With both the data and the positioning material on the pads, priority-sequence step is used to bring them to the display.

Pack of Pads

The pads are rather like a pack of cards, each providing a complete definition of a display and able to be shuffled at will. Each area of the display shows anything that the top pad asks to be displayed, and any area that is

not used by the top "card" or pad then displays matter from the next pad, and so on and so on.

Apollo currently expects only about the top five or six pads to be used to provide displays, but this seems to be very dependent upon the applications.

One of the difficulties in evaluating how much information this setup provides comes from the fact that implicit, as well as explicit, information is present.

For instance, suppose one pad produced by the electronic mail system, for instance, were to be the words "NEW MAIL RECEIVED" in a position on the top right of the screen. Another pad might use the same position for "STAFF MEETING — IN FIVE MINUTES." And the time of day

might well use the same position for its display, as well.

If the priority of the three pads were set with staff meeting first and time of day last, a display of time would also mean that there was no staff meeting coming and that no mail was waiting for attention. Management-by-exception thinking can be used here.

And at the same time, the rest of the screen would be providing different sets of information, photos or what have you from the other pads.

The display becomes a monitoring and control panel, with potentially as many different events or pieces of information being reported or provided as are requested.

With these display possibilities and the ability to evaluate, report and generally back up management decision-making, Apollo-type systems could be important new tools for management teams.

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LETTERS

Not Only Conclusions

Dr. Robert Parslow chided me for ignoring the facts surrounding his predictions about the computer's alleged degradation of the quality of life [CW, Nov. 3, Dec. 8, Dec. 29].

I do not believe that I am unaware of the social conditions and trends he attempted to explain. However, I also do not believe that his conclusions, even if they are based on evident data, are the only ones that can be drawn from the available evidence.

I apologize to Dr. Parslow if that appears to him as an attack on his integrity.

Reinhard Mirkovich

Lowell, Mass.

Listen to Operators

The letters about "The Silencing of a Computer Room" [CW, Nov. 17] ignored the point that the computer operator's knowledge is a resource that should not be ignored. The operators are the people who get the job done and who know the machine operations best. They don't need unnecessary work.

The programmer should have listened to the operator because the saving of runtime (CPU or elapsed time) is a benefit to the company. Sometimes things done when bringing up a new system are not necessary once the system is operational.

Proposed changes should be in writing, and management should answer in writing.

However, most managers won't describe their operations' obvious flaws in writing.

In addition, management's answer should be discussed with the operator.

It has been my experience (20 years in DP) that when a programmer won't listen to an operator, there is a large ego in the way.

Bob Register

Pleasant Hill, Calif.

	1979	1978	Change
Significant Figures (000 omitted)			
For the Year			
Premiums written	\$338,150	\$313,725	7.8%
Premiums earned	332,775	304,217	9.4
Underwriting income net of expenses	(2,256)	(13,854)	83.7
Investment income before taxes	40,865	51,136	27.2
Net operating income after taxes	38,957	17,054	128.4
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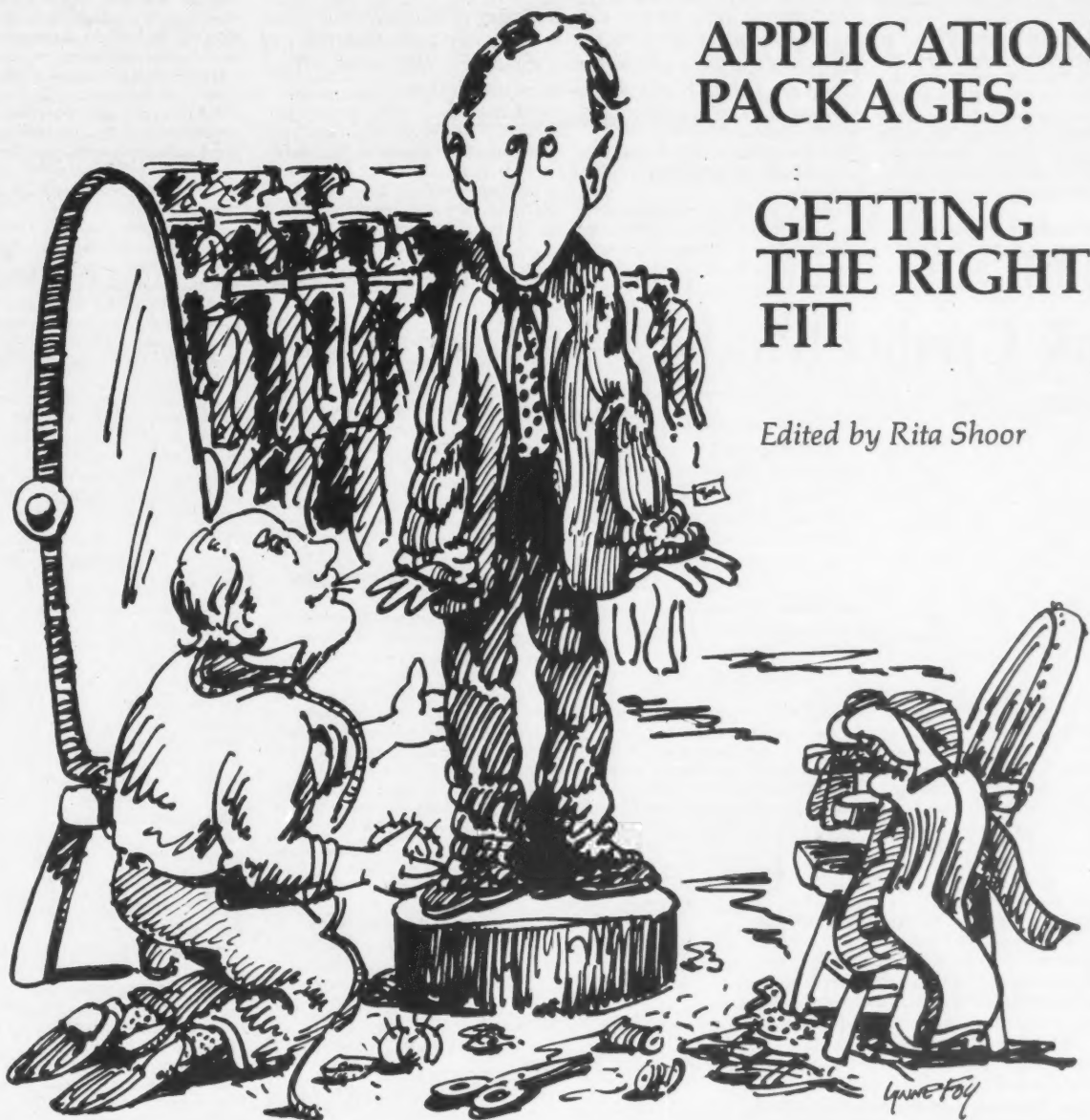
January 26, 1981

SPECIAL **REPORT**

APPLICATION PACKAGES:

GETTING THE RIGHT FIT

Edited by Rita Shoor



 **COMPUTERWORLD**
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

SPECIAL REPORT

New Products Sighted

Applications Packages Verging on Second Age

By C.C. Dilloway
Special to CW

STROUD, GLOUCESTERSHIRE, England — If the evolution and development of products is considered to take place in generations, then commercial applications packages have probably not yet entered their second generation.

A generation is complete when its lessons have been learned and are ready for incorporation into newly developed products. Since most commercial applications packages are enhanced versions of systems originally developed for a specific requirement, there is little evidence of earlier learning being incorporated into new products.

New generations of products are expected to emerge in the marketplace sometime in 1983. By then, the existing products will have captured most

of the possible first-time users and the earliest users will be seeking more satisfactory replacement products.

cessful use.

However, the fallacy of this thought is revealed if the commercial applica-

While computer hardware may be verging on its fourth generation, applications packages have yet to enter their second phase of development, according to C.C. Dilloway. The British consultant pointed out some elements to look for in applications software of the future during a speech before the commercial special interest group at a Digital Equipment Corp. users' meeting.

The new products will consist of elemental design specified by a set of coherent entries.

It is true that users' requirements in the same application area usually vary. This argument is often used to dispute the possibility of commercial application packages having a wide and suc-

cessful use. However, the fallacy of this thought is revealed if the commercial application area is examined in finer detail. In any one commercial applications area, there is only a finite number of different elemental functions even if each user has his own mix of these elemental functions. The number of separate elemental functions spread among multiple users gives the ap-

pearance of an infinite number of different requirements.

At this relatively early stage in the life of commercial applications package development, it is difficult to discern what these elemental functions are. However, it should eventually be possible to specify the elemental functions and develop methods by which they can be brought together in those combinations that a user requires.

The selection of a user's requirements from all those elemental facilities provided in a package is by means of parameter entries. As additional facilities are required by market-place demands, they are added to software packages under the control of appropriate parameter entries.

It is inevitable that after a few years of use and evolutionary enhancement, more parameter-controlled facilities will have been added to the package than were available on its original release. As these facilities are added, they often receive a different treatment from those in the package originally provided.

The effect is that similar types of specification entry will be implemented in different ways. This results in parameter entries that do not present a coherent whole to the user. He is faced with learning several different ways of implementing similar functions.

Design Objectives

Few packages have as yet been designed as an enhanceable whole from inception, and this piecemeal implementation can be observed in the way the package facilities are specified.

Simplicity, power and flexibility are the design objectives of any commercial application package.

Simplicity may be defined by stating that it is achieved by those packages with the lowest number of parts. A "part" in this context includes everything from the number of different forms used through the number of programs supplied to the number of parameter entries permitted.

Power belongs to any package that covers more of the application area than might be covered by a competitive product. Few users require a package with facilities for meeting every conceivable requirement in an application area. However, most users will need several of the application's fringe requirements.

A package should cover all of these fringe requirements so that the particular requirements of each of the package's users may be met. When the features of two packages are compared, one may be found to be more powerful than the other through an examination of the features it covers.

Flexibility is the software's ability to meet the changing requirements of its many users. A flexible package can be adapted to meet alternative processing methods within one of the major requirements of the applications area served by the package.

Dilloway is an independent consultant who specializes in all areas tied to commercial applications software packages.

Bank Credits Model's Performance

By Richard S. Stefka
Special to CW

CLEVELAND — Prior to 1970, planning for most companies did not require extensive effort. In many instances, planning added up to the organization's response to a simple upward linear trend.

Times have changed with planners referring to the late 1960s and the decade of the '70s as the "age of discontinuity." Terms like "inflation" and "recession" took on new meanings, and new words like "stagflation" were coined.

Economists attempted to explain these rapid changes with econometrics — the use of mathematical and statistical methods to develop economic theories. Computer technology greatly facilitated major advances in econometric applications and many people realized that models could be built for in-

Inflation, recession, stagflation — the economists who guide companies through these troubled waters increasingly rely on computer software to help with econometric modeling. Stefka describes the series of decisions at Ameritrust Corp. that led to implementing one of the application packages designed for statistical analysis.

dividual organizations as well as for the national economy.

Ten years ago, Ameritrust Corp., a multibank holding company with consolidated assets of \$5.4 billion, developed its first computer model.

The model was built with Basic and

Fortran through a time-sharing service using a teletype machine. It suffered from the problems associated with Basic, Fortran and similar languages: documentation, complex logic and a general lack of user-oriented features. A trained programmer was almost a necessity because of these considerations.

While software for modeling was being developed, the firm also created data bases to support the modeling function. After two years, the model was rewritten on a system from a time-sharing services company. It provided a high-level user-oriented language, time-series exogenous variables, a macro model of the economy, and any required programming support personnel.

Then, four events occurred to prompt rethinking the model. First, at

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SPECIAL REPORT

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Applications Software Rated Tops in Growth

By Carol Weizmann
And Cary Morrill
Special to CW

WALTHAM, Mass. — Applications software packages continue to outstrip both utility and systems packages in terms of market growth, according to the "Independent Packaged Software Reference Book" from International Data Corp. here.

By 1984, applications products are expected to bring in 55% of the independents' package revenues. This market sector is occupied by numerous software houses that concentrate on selling applications systems rather than application routines or subsets.

Many of the software vendors — par-

ticularly those selling only to certain industries or application areas — do not compete among themselves.

"This marketplace," IDC's report pointed out, "has attracted many smaller competitors, and, unlike the systems and utility sectors in which the leading vendors control almost half the market, the major suppliers of applications software account for a little less than a third of total package revenues."

The study identified five major application areas where software packages have been sold successfully: accounting, payroll/personnel, manufacturing, banking/finance and insurance.

Although accounting application packages were among the first avail-

able to users, this market sector is a long way from mature, leased on growth rate. The IDC study anticipated a 32% compounded annual growth in accounting package revenues through 1984.

However, this market's status is signaled by the size and position of its major vendors. Eight suppliers received two-thirds of the revenues generated in this sector in 1979. Leader Management Science America, Inc. boosted its revenues nearly 100% between 1977 and 1979 and most of the other top vendors have doubled size over the two-year period (Figure 1).

Payroll/personnel software package sales are increasing as more managers understand the importance of effec-

tively managing human resources. These application product revenues are expected to grow at about 30% a year through 1984. Among the trends that encourage users to invest in this software are the flood of federal regulations concerning employment practices; the skyrocketing cost of labor and benefits; and the need to provide software for non-IBM hardware with an emphasis on minicomputers.

With Martin Marietta Data Systems, Inc. claiming 34% of sector revenues, approximately six suppliers control nearly 60% of market share in the manufacturing software sector (Figure 2). Virtually all of these firms have realized enormous growth recently, al-

(Continued on SR/4)

Third Parties See 33% Gain In '80 Revenues

WALTHAM, Mass. — Revenues for third-party-supplied software packages grew 33% in 1980 over 1979's \$920 million, according to the "Independent Packaged Software Reference Book" from International Data Corp. (IDC) — and the end is not in sight.

This market is expected to expand at a 29% annual rate through 1984 when revenues may hit \$3.5 billion, according to the market research firm here.

IDC indicated that end users are increasingly receptive to the acceptance of independents as a viable alternative to in-house software development or purchasing software from hardware vendors. It also appears that the independents are responsive to the demand for user-friendly systems based in nonprocedural languages with English-like commands.

The lack of vendor support in terms of training, maintenance and enhancements from some hardware suppliers is another factor that contributes to independent packaged software supplier sales, according to the firm. And the minicomputer market appears to be generating momentum for third-party vendors as users demand software, particularly in the applications area (see story above), for their minis.

However, IDC also saw clouds on the independent supplier horizon. A serious lack of programming personnel appears to be slowing new software development and is forcing some firms into expansion through acquisition rather than through internal development, IDC noted. If this acquisition trend continues, small vendors might experience greater difficulty in surviving in the marketplace.

Competition from hardware vendors also seems to be on the upswing in all software package market sectors, according to the report. Turnkey systems houses are joining hardware firms in a perception of the revenue potential from the software market.

In summary, the software market is definitely on the rise, IDC said. For example, Informatics, Inc. was the only vendor with reported revenues in excess of \$30 million in 1978. But by year-end 1979, both Management Science America, Inc. and Cincom Systems, Inc. reached \$30 million.

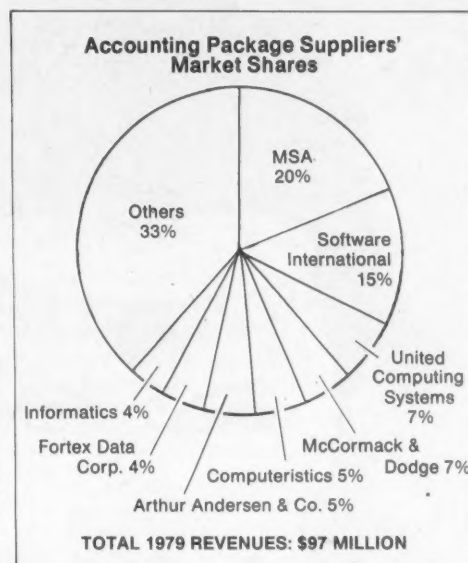


Figure 1

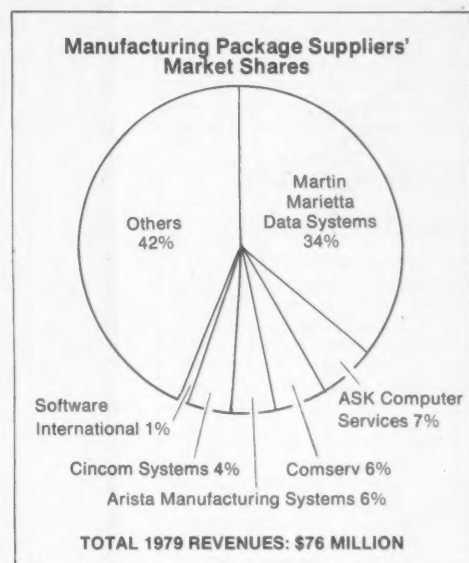


Figure 2

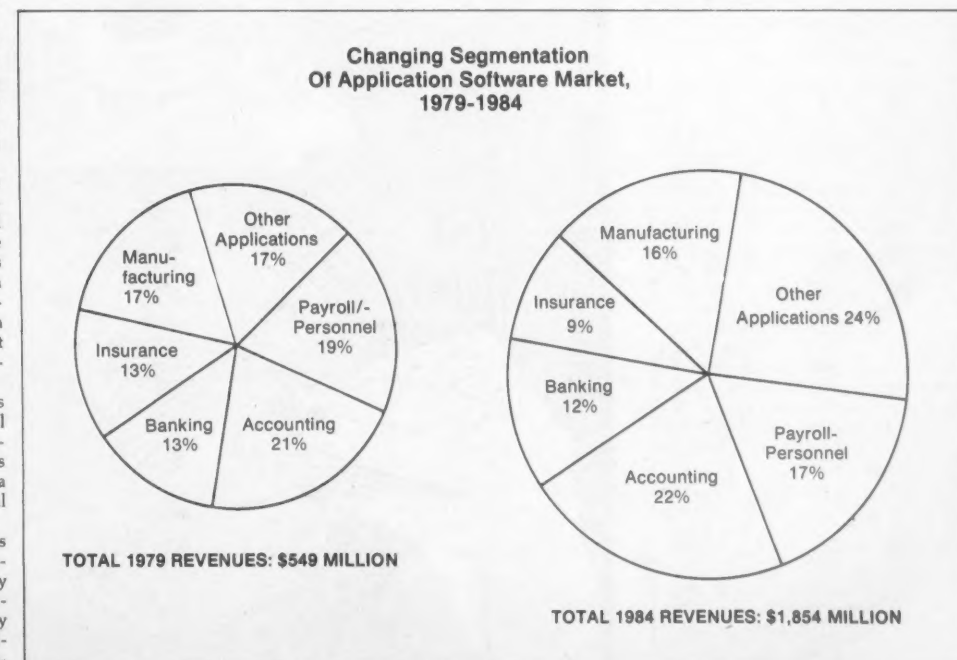


Figure 3

SPECIAL REPORT

Page 4

Applications Software Growth Rated Tops

(Continued from SR/3)

most tripling revenues in the last few years, and IDC projected a 31% a year growth in this market into 1984.

Several factors are expected to contribute to end-user demand for these offerings: the appeal of minicomputers to smaller manufacturing companies that seek an alternative to service bureaus; increasing interest in interactive, integrated manufacturing systems and new applications — shop floor control, for example — and the fact that international markets are opening up.

Although banking and financial firms often utilize in-house development or computer services, the potential for application software packages is good in this area. Although individual suppliers are not expanding as rapidly here as in other applications arenas, a yearly revenue growth of 29% through 1984 is anticipated.

Despite a banking trend toward integrated systems, there is room for ap-

plication packages that address problems generated from ongoing changes in the regulatory and technological milieu. In addition, international banking systems seem to be attracting increasing interest, according to the IDC study.

Independent software package suppliers face relatively slow going in insurance markets. These companies were among the earliest of computer users and seem more likely to develop software in-house or acquire it from the hardware vendors.

A 23% annual growth rate in insurance software package revenues is projected through 1984. Five suppliers

control 60% of the market, with Insurance Systems of America, Inc. boasting a 20% market share.

Influences attracting insurance industry users toward independent software packages include the burgeoning cost of in-house software development; constant changes in the regulatory environment which in turn create new reporting and disclosure requirements; mounting demand for distributed systems that may extend home office functions such as quotations; and list maintenance into the field. Moreover, property/casualty insurance companies, which are traditionally less automated than life/health

firms but are faced with greater volume in policy and payment transactions and fast-changing regulations, are a promising market for independents.

A strong future for applications software package suppliers in new industry and application areas is also indicated. The report's "other applications" category is expected to grow faster than any other industry sector and account for \$451 million in revenues by 1984 (see Figure 3 on SR/3).

Weismann is manager of the services and software information program at IDC. Morrill is research analyst at the same firm.

Bank Credits Model Package

(Continued from SR/2)

least 80% of the model's data requirements included Ameritrust historical financial data; this data had to be manually collected and input prior to running the model. To facilitate the tedious collection and summarization of the data, Ameritrust purchased a software package from SAS Institute, Inc.

Since most of the data already existed, it appeared that if programs written with the Statistical Analysis System (SAS) package could feed the model directly, a superior model could be developed. And after IBM's Time-Sharing Option (TSO) became available throughout the bank, evaluation revealed that SAS was theoretically capable of driving the model.

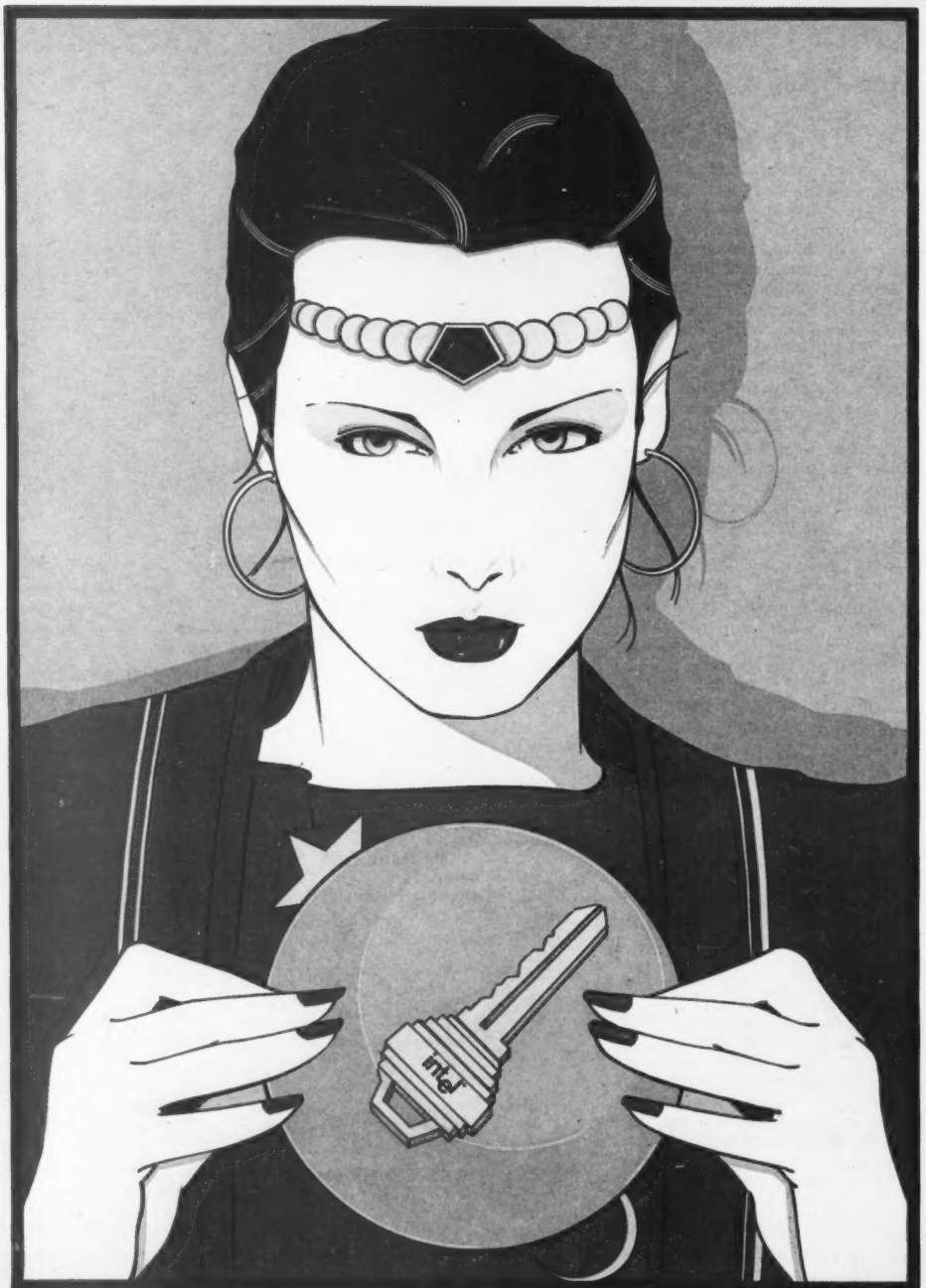
Time Series Access

Second, the company's chief economist felt that although access to a macro model of the economy was not required, access to the time series was a necessity for analysis. In addition, these time series were needed to update the model's forecasting equations, as well as income and expense equations. These time series were provided by Citibase, a subsidiary of Citicorp, on a monthly or quarterly basis.

Since the economists' function is to analyze and synthesize available economic data, exercise judgment and provide input into planning and investment functions of the bank rather than to out-guess the rest of the nation's economists, Ameritrust felt it could rely on a relatively low-cost forecasting service.

Fourth, since the model had been used extensively for such applications as a top-down check of the annual budgeting process, regular monthly forecasts, long-range planning evaluation and evaluation of balance sheet and structure options, the time-sharing costs approached the six-figure mark.

Stefka is a corporate planning officer with Ameritrust Corp.



SPECIAL REPORT

Page 5

Especially With DBMS

1980s: Decade for Prudent Software Purchasing

By Stephen V. Wright

Special to CW

While the 1980s may be the decade of purchased software, it is also going to be the decade for prudent software purchasing, especially if your environment includes a data base management system (DBMS).

Consultants, vendors and end users are all aware of the advantages to be gained when using purchased application software. The list typically includes the money saved by not reinventing the wheel in-house and usually mentions that the purchase of

software allows the DP manager to bypass the problem of finding a new assignment for five extra programmers to do 12 to 15 months from now when the in-house application is completed. The second item applies even though you know that 12 to 15 months from now you won't have to find something for these extra people to do because they will each have a seven-month backlog of program modifications.

But what about the hidden side of purchased software to be used with a DBMS? Processing efficiency is the first factor under consideration. Many

software vendors currently advertise packages as being available for different DBMS. A significant number of these software packages were written when the DBMS concept was not widely used. As a result, most of these applications are designed to work with sequential or Isam data sets.

And, many vendors feel that it is too expensive to rewrite application software in order to make the system compatible with a data base management package. Instead, there is a replacement of the "gets" and "puts" of the application with data base call com-

mands, using the data manipulation language of a particular DBMS. It allows a relatively quick conversion, especially if the input-output statements are isolated in a particular segment of the application.

In many cases where the number of data base records is small or the processing per day is relatively light, this "quick and dirty" conversion process will work reasonably well. However, the user may run into some problems with the very large data base systems which are more typical in any heavily utilized application.

Converted Process

An example might be a large, diversified corporation that has replaced five personnel application systems and data files with one centrally located data base management file and a purchased personnel application software package. The package might locate data in the personnel system by sequentially passing through one record at a time until the correct record is found. If each of the five divisional systems had 20,000 to 30,000 people in its particular master file, the result would be a data base of 100,000 to 150,000 records when the systems and data were combined. A sample request might be to find the employees with Ph.D.s in chemical engineering. If there are just three employees with this characteristic in this particular company, a search is going to be conducted for three records in a data base of 100,000 to 150,000 records. Since the application package was designed to read data sequentially, there is a possibility of accessing more than 149,997 records in order to find the three valid records.

Contrast this converted application to a system designed to use the DBMS efficiently. It would probably use the more powerful data manipulation language supplied by the vendor to look for those three records rather than sequentially passing through each record in the data base. With an inverted data base, for example, the search for the three records would take place in the associator or index of the data base, and the records would be found relatively quickly since the application program would search through the index of the records rather than the actual data records themselves. Therefore, a search that might take a converted system a minute or more would take only a few seconds in a system that was written to work with a particular DBMS.

Recovery Factor

Recovery is another factor to consider when selecting application software to run with a DBMS. When an application system runs with a sequential file, recovery from a system crash is accomplished by reloading a copy of that file from tape to disk and starting the program over again.

This recovery method is not available with most DBMS. Instead, DBMS software utilizes checkpoints where all updating to the data base is temporarily suspended. Then, the system writes

(Continued on SR/6)

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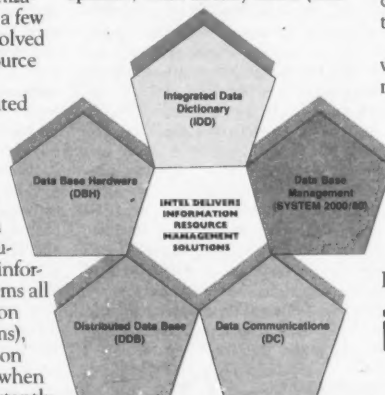
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SPECIAL REPORT

Page 6

Long-Term Sales Programs Sought

Demise of Unethical Software Hustler Predicted

PENNSAUKEN, N.J. — The prudent applications package customer should probably maintain a certain amount of skepticism when confronted by an enthusiastic software salesman, but the likelihood of being hustled by an unethical salesman in today's marketplace has been "vastly diminished," according to a report on "Software Package Selection and Acquisition" from Auerbach Publishers, Inc.

Most software vendors recognize that potential damage to a long-term

sales program from a poorly placed sale is greater than the immediate benefit from any specific sale, author Albert C. Lowenstein from Data Interface Systems Corp. said.

Personnel in purchasing organizations increasingly perceive the need for thorough requirements analysis and package evaluation as software marketing becomes more commonplace.

Still, he recommended that purchasers keep in mind that their procurement cycle is essentially a sales cy-

cle to the marketing organization, and just as the purchaser attempts to develop a strategy for procurement, the marketing firm is discussing techniques for selling its products.

Low-cost software system sales (defined as costing less than "a few thousand dollars") may only require a few telephone calls, mailing a brochure and user documentation and delivering the source programs and documentation. However, the purchase of more expensive or complex systems usually in-

volves many vendors and a period of several months, Lowenstein noted.

He recommended that all vendor contact be avoided until a general requirements statement has been drafted. Once this statement has been formulated, the next logical step is to bring in vendor representatives.

Keep in mind that vendor sales personnel can actually be "very helpful in determining whether they should be involved" any further in the acquisition process, Lowenstein said. The vendor who cannot satisfy the purchaser's requirements will often remove himself from marketing competition and will sometimes steer the purchasing organization toward an alternative of which it was previously unaware during this elimination process.

Qualify Market

A vendor must qualify its market, Lowenstein noted. Thus, when a salesman asks to speak to someone at a high organizational level, it is not necessarily an indication that he is going over the head of the firm's technical representative. The salesman often wants to be sure that there is a reasonable probability that his efforts will result in a sale, he said.

However, unethical salesmen have been known to discredit the legitimate efforts of a software selection team by attempting to have requirements statements conform to the capabilities of a package, Lowenstein warned. Although a technical evaluation committee has a "limited defense" against such tactics, the most effective tool is open communication with upper management. If the upper-level managers have faith in the qualifications, expertise and preparation of selection committee members, the managers will be inclined to support the technical staff.

The customer should also realize that the salesman's role is "not strictly that of a manipulative strategist." He must not only communicate the properties of his package to the purchaser, but also try to determine the user organization's needs so that he can be of more assistance, the reporter noted. The purchaser who withholds information from a salesman may be doing his company a disservice.

Get Contract Copies Early, Buyers Told

PENNSAUKEN, N.J. — Obtain a copy of all competitive vendors' contracts early in the software package selection process, Albert C. Lowenstein advised in a report on "Software Package Selection and Acquisition" for Auerbach Publishers, Inc. (see related story on this page).

This allows time for the contracts to be passed to the corporate legal staff who can determine whether the contracts are acceptable, he noted. Any problems should be mentioned to the software sales representative as early as possible to avoid coming to an impasse after the purchaser and/or the investor has invested an extensive amount of time and effort, he said.

If enhancements to the vendor's package are anticipated for a particular user, the vendor's willingness to provide these enhancements should be determined and these statements of willingness should be in writing whenever possible. Many formal contracts explicitly disavow verbal statements made by marketing representatives, Lowenstein pointed out.

The contract should also state that the package will work in accordance with the system documentation provided by the vendor, according to the report. This includes not only formal user documentation and programming documentation but also any proposal submitted by the vendor in response to

the formal request for proposal (RFP) previously issued by the customer. The fact that the vendor will be bound contractually by the terms of any proposal submitted in response to an RFP should be firmly established early in the software procurement process, the report noted.

Price Negotiation

Even when existing software and services are inflexibly priced — as is sometimes the case with larger vendors such as IBM — certain aspects of the purchase such as system modifications are subject to "significant negotiation," according to Lowenstein.

Unless an enhancement is so highly specialized that the vendor cannot reasonably expect to market it to other organizations, any enhancement provided for one purchaser will benefit the vendor's marketing effort and vendors can "usually be persuaded to perform system enhancements for a nominal sum," he claimed.

Since there is little room for negotiation once a particular vendor's package has been selected, contractual negotiations should be conducted early in the selection process, he said.

The organization must understand its requirements for information and must be prepared to evaluate and analyze information when it is received in order to deal effectively with the soft-

ware sales representative, he noted. The procurement cycle can proceed in a cost-effective manner within a reasonable time period if this is done.

The simple fact that a software procurement effort has been initiated does not necessarily result in a software purchase, he said. The prospective customer may find that existing software packages are unsuitable to its needs, prohibitively expensive or inferior to software that can be developed in house.

Assuming that the cycle has proceeded to the point where it is determined that the intended system is feasible, procurement is comprised of the following steps: preliminary requirements analysis, identification of candidate vendors, initial vendor contacts, detailed studies of competitive packages, contract negotiations, formal requirements statement (RFP), identification of system modification requirements, features analysis, selection decision and installation, trial use and acceptance.

Contact with the vendor does not usually stop when the package has been installed, Lowenstein said. The vendor's responsibility for maintenance, enhancement, training, documentation and continued technical liaison will vary depending on the type of package purchased. However, if the vendor is responsible for software maintenance, a specific person or group in the client organization should be designated as primary vendor liaison, he said.

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1980s: Decade for Prudence

(Continued from SR/5)

all of its current data base modifications to a disk file and a transaction log, typically a magnetic tape. If processing is interrupted, the data base administrator "rolls back" the data base to that checkpoint. This roll-back procedure restores the data to its pre-updated values and to a point in time when the data was valid.

In order for this to work, the application program must include logic to sense that a checkpoint is being taken and to keep track of its position in the input files when the DBMS took the checkpoint. When the application system is restarted after the data base has been restored, it can continue processing with the next logical record.

The problem is that an application

program that was converted from standard file processing to a DBMS may have no recovery logic other than to start over in the event of a system failure.

These considerations do not mean that purchased software should not be used with a DBMS or that all purchased software is converted inefficiently from a master file to a DBMS environment. The trend is toward purchased software and that movement will continue. But the prudent application software purchaser should study how the product functions as well as what it can do.

Wright is a free lance consultant based in Sunnyvale, Calif. who specializes in working with data base management systems.

SPECIAL REPORT

Page 7

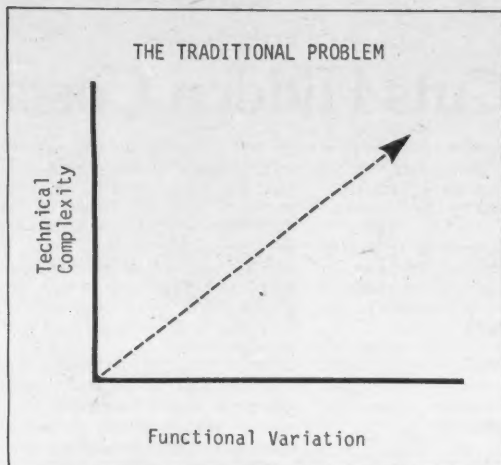


Figure 1. Using the traditional approach to system design causes technical complexity to increase at a rate proportionate to the degree of functional variation.

Manufacturing software packages can function in either a trouble-generating or peace-making capacity between DP and manufacturing user areas, according to an article in *Inventories and Production* magazine. Butts feels that the traditional approach to application software packages leads to problems. After outlining some difficulties inherent in this traditional approach, he describes the principles of a new methodology for manufacturing-oriented software.

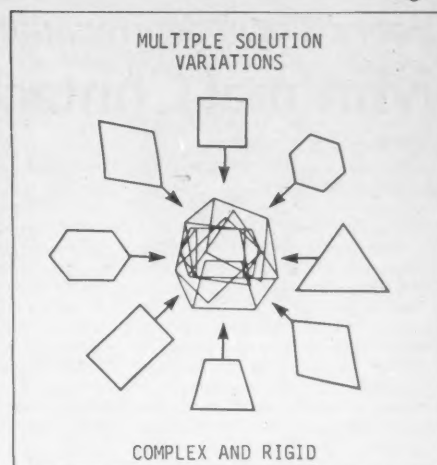


Figure 2. Traditional "multiple solution" packages have tended to be complex and hard to properly document. Such packages are resistant to change.

Package Design Must Provide for Flexibility

By James T. Butts

Special to CW

CINCINNATI — Application software products exist in order to support the operational needs of business and industry. Every application system is a set of programs designed to support these functional needs through the use of specific DP procedures.

DP solutions provided by an application product can vary in a multitude of ways depending on the particular approach taken by the designer. The two primary dimensions of this variation are:

- The functional capability of the application software product.
- The complexity of the system as a data processing entity.

These two dimensions nearly always relate in direct proportion. The more completely the system attempts to satisfy broad ranges and types of needs, the more complex the data processing procedures become (see Figure 1). This increased complexity increases the cost of constructing and maintaining such a system. It is quite probable that this cost will be recovered in the form of a higher purchase price.

In addition to the higher cost associated with the development of a more complex system, the system tends to become more rigid in its structure. This rigidity makes the system less able to accommodate the variations that are present in the initial detailed definition of the same category of system's need within different companies. It also makes the system less responsive to the changing needs of any given company over time because a complex system is more resistant to modification and extension.

Some creators of application systems have tried to resolve this rigidity problem by introducing even more DP complexity into application software products. In order to provide the ultimate solution for a broad variety of prospective users, systems have been designed to appear capable of being configured in a multitude of ways. This has resulted in even higher development costs, higher selling prices, more complexity and less real potential for success (see Figure 2).

The multiconfiguration product rarely provides the optimum solution to the specific and unique functional needs of an individual company. At best, only one configuration is a close approximation of the actual solution to the user's problem. Therefore, the remainder of the multiple configurations are of no use and a portion of the purchase price that has been paid for the complete product is effectively thrown away.

Furthermore, this close approximation is not the ultimate solution required by the user. The product must be further modified, or expanded, in order to completely satisfy all operational requirements. The end result is often a complex system that had initially cost an unnecessary amount and will continue to cost more than necessary to modify and support as time goes on.

Better Approach

A compromise is needed between functional complexity and DP complexity. Providing multiple versions of finite solutions to a problem and suffering the attendant extraordinarily high level of DP complexities is unnecessary.

The use of tested and field-proven approaches to correctly solving the basic functional system needs of most manufacturing companies is a desired improvement in systems development techniques. Designing and documenting basic yet functionally complete solutions and packaging them to accommodate subsequent user tuning and modification is highly desirable. DP and manufacturing control technologies are now available to make such design criteria feasible.

The portions of an application solution that may be considered basic and somewhat common among companies are:

- *Data file requirements.* Although field formats and length may vary, the basic data categories, contents and relationships remain the same.

- *Transactional and report data.* Formats may again vary from one company to another, but transaction types and report contents remain consistent.

tently common.

- *General processing logic.* Specific processing logic may vary among companies in order to support individual requirements; major processing logic, however, is consistent because the data base, transaction types and content, and output requirements are common.

- *Basic controls.* Principles and techniques necessary to perform the primary functions of master production scheduling, material requirements planning and shop floor control have been identified, field-proven and documented.

In addressing these common areas, recent developments in DP can be employed. They reduce the overall complexity of the system and provide greater flexibility for specifically answering the needs of the user. They include:

- *Standard ANS Cobol.* As an application programming language, it is the most accepted in the industry and provides the greatest degree of hardware independence.
- *Structured programming techniques.* These disciplines ensure well-documented, consistent and logical code, ensuring ease of program maintenance and modification.
- *Data base management systems.*

These reduce data and file manipulation problems, provide flexible data relationship capabilities and provide a high degree of hardware and operating system independence.

Basic Considerations

Because change is a certainty of manufacturing, a new approach to manufacturing application software development is needed to address the continual evolution in manufacturing control systems and objectives. Essentially, the needed approach must consider:

- A thorough working knowledge on the part of the systems designer of the basic principles and techniques relevant to effective manufacturing control, with a keen understanding of the interrelationship of the various techniques and subsystems.
- Provision of functionally complete systems capable of being used as delivered or of being easily tuned by the user to suit unique requirements.
- Independence from computer hardware, operating systems and specific manufacturing technologies.
- Thorough and easily used documentation for both technical and non-technical personnel.

(Continued on SR/8)

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SPECIAL REPORT

Page 8

Saves Time, Aggravation, Dollars

Minimal Contact Marketing Cuts Hidden Costs

ENCINO, Calif. — While the costs of the software supplier are built into the product price, there is also a "hidden cost" in customer time taken up by more traditional marketing approaches, according to Stephen Hicks, vice-president of marketing for Dylakor Software Systems.

Out of the effort to cut down these areas of hidden costs, Hicks recommended that the potential purchaser consider the following points when shopping for software packages:

- Does the vendor aid in the evaluation process by providing any basis for

comparison with similar products?

- Are references from current product users readily accessible?

- Does the software house allow for testing the package prior to purchase? Hicks maintained that the seller should make the software available for some sort of "free trial period."

- Review whether the product is installed by the end user or by vendor representatives. If specialized installation techniques and support personnel are required, satisfy yourself that the product is not overly difficult to handle in your environment.

- Keep in mind that while the presence of a large support staff from the vendor may be a positive factor, it can also mean that the system is problem-prone.

- Maintenance agreements should be subjected to careful scrutiny since, for example, some agreements require a special provision for automatic receipt of software update releases.

- Determine if the training tools offered by the vendor — regional seminars, audio cassettes or workbook programs, special sessions — meet the needs of your personnel.

- Are extensive modifications necessary to make the software package meet your requirements? If so, it may be prudent to shop further for applications software that is a closer match to your environment.

- Determine if the product has been installed by other users in your geographical area. If so, there will be a pool of personnel with previous product experience.

- Is the lease price of the packages structured at a level that makes it more sensible to buy the software? If so, consider whether owning the product will be of long-term benefit to your organization.

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Model 204

Package Design Needs Flexibility

(Continued from SR/7)

- State-of-the-art programming, system construction and data management techniques.

- Simplicity in all regards so that people will understand, accept and use the system.

A prime benefit derived from the successful use of this conceptual approach is an improved working relationship between DP and manufacturing departments. The company no longer must depend on the software vendor, hardware vendor or consultants to accommodate changing and evolving system user needs.

Properly designed and documented software packages are company-manageable entities. This tends to assure both DP and manufacturing that evolving user needs can be accommodated in a much more acceptable time frame with a minimum of software conversion, development and interface work.

Software packages are viewed more and more by both areas as a solution to the problems created by rigid, functionally inadequate in-house systems. However, software packages that are not designed to allow user flexibility in the ever-changing manufacturing environment will not be successful. Software packages must have an architecture that allows the staff to respond in an expedient manner to valid requests for change from the manufacturing system user community.

Typically, the rigid, complex nature of traditional application software packages in combination with generally poor documentation causes slow DP response to user problems and requests. Such slow response is usually interpreted as "lack of response" by the system users, and thus we have the traditional barriers formed between system custodians, developers and users.

Correctly addressing such software package architecture and documentation will accommodate a short initial implementation cycle and will tend to ensure that the system can evolve and survive as manufacturing system needs change.

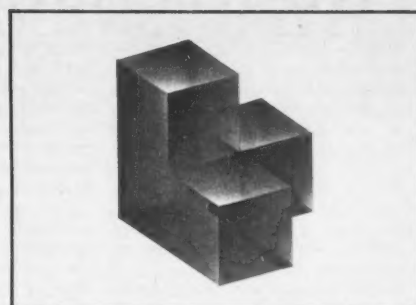
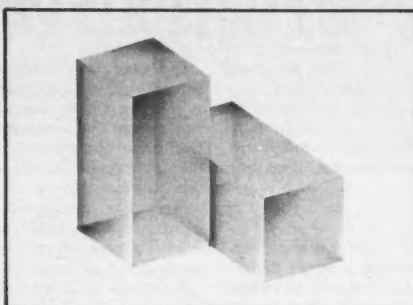
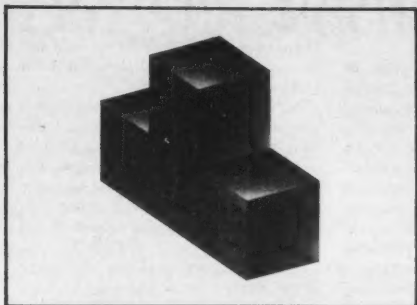
Butts is a senior manufacturing industry consultant for Cincom Systems, Inc.

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Multiple Systems Users

MVS/VS1/SVS/MVT/MFT



UNIFIED DEVICE MANAGEMENT

The Multiple Systems Manager manages the allocation of TAPE and MOUNTABLE DISK devices across all systems in your complex. It allows you to operate normally with all devices ONLINE to all systems. MSM insures that device allocation by jobs in different systems occurs just as if all jobs were operating in one single unified system.

MSM eliminates the operational burden of juggling TAPE and DISK units among systems. It protects against the danger of a system accidentally rewinding or overwriting a TAPE in use on another system; this removes the single greatest cause of shared tape mishaps.

MSM will use your TAPES and DISKS more efficiently—which can result in immediate device cutbacks or (more likely) postponement of future acquisitions.

MSM is so transparent that it can be operated without the use of any new operational commands. Of course, there are powerful new commands available—however these are extras, not necessities.

Only MSM allows such truly NATURAL and transparent shared device management.

Other features (for MVS environments only): The MSM Device Preferencing capability allows devices to be dynamically structured into a hierarchy of sets; MSM insures that units in preferred sets are used, wherever possible, before less preferred sets.

The MSM SOFTSWAP™ feature insures that DDR device SWAPS for TAPE units will NOT impact JOBS or TSO users which are not using tape allocation. Without SOFTSWAP™, TAPE DDR SWAPS are likely to impede all allocations in a system—including even those which do not use tape.

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Allen Services' line of software packages for Multiple System environments, allows an entire complex of systems to be treated almost as though it were one single unified system. The complete "unified system" effect is achieved through combined use of three independent (but related) program products. Each of these, Super-MSI, MSM and GCD addresses distinct concerns present in multi-system environments.

Of course, since the products are independent, if you aren't yet ready for the full-blown unified system effect, you only need to select the products which interest you.

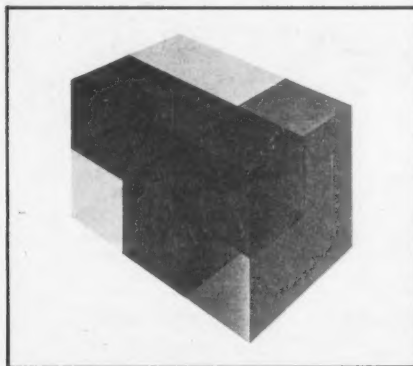


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The Global Console Director is an extremely flexible tool. It allows (selected) message streams from different systems to be logically "blended" to create a unified system image (to whatever degree desired). In a slightly different vein, GCD allows any console on any system to be logically attached concurrently (and perhaps in different ways) to any set of systems in your complex! GCD allows commands entered from any console to be directed and processed anywhere in the complex; in this respect, all consoles are effectively linked to all systems. In almost every aspect, GCD is philosophically and operationally compatible with the standard system console support.

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Another feature: Super-MSI also eliminates the hardware RESERVE lockouts which are normally inherent with SHARED DASD in multiple system environments.

Much more besides: Super-MSI has many other exciting features including special aids for operators and TSO Users. All in all, Super-MSI will be a very powerful addition to your installation.

If you wish to use more than one of the above products, they can be integrated together into a single control task (thus further reducing overhead complexity). In nearly every instance where our products have been competitively evaluated against all possible hardware or software alternatives—our software has been chosen. Aside from IBM, Allen Services has been providing commercial software specifically designed for multiple system environments longer than any other company. Over 500 major installations throughout the world have already selected our products as the preferable means of handling problems associated with multiple system environments. The number grows daily. Reliability has always been an integral part of our design.

When considering software, most people consider support to be a very important factor—Allen Services has over 200 support personnel.

The only other comprehensive approach to unifying multiple systems is JES3 (or ASP). Aside from the fact that MSI/MSM/GCD can be installed and implemented in only a few minutes, there are several other significant differences from JES3: For example, MSI/MSM/GCD (combined) use only 1% to 2% overhead; MSI/MSM/GCD are invisible to your users; MSI/MSM/GCD were designed to be strictly compatible with OS/VS/MVS philosophies—in this regard none of your personnel will require re-training. The majority of all eligible multiple system installations are now using our products to help manage their systems.

SPECIAL REPORT

Page 10

Five-Year Advances in Manufacturing Sighted

WEST HARTFORD, Conn. — "Two-thirds of all small to medium-sized manufacturing companies in the U.S. will be automated within the next five years," Arthur Martin, president of Computer Covenant Corp., recently predicted.

Martin addressed members of the Connecticut Accounting Profession here during a seminar series entitled "Advising the Small Businessman on Automation."

He maintained that "packaged systems and programming aids are a good solution to the growth of the [manufacturing] industry and the need for more advanced applications." The ex-

pense and scarcity of trained programmers and the "high risks associated with new program development" were the factors that led manufacturing companies to purchase applications packages to meet current and future information requirements, according to Martin.

"Packaged solutions are designed to handle the majority of the user's requirements," he noted while conceding that "a packaged program cannot possibly meet all of the requirements of every customer."

"The intention [of the software vendor] is to provide a base from which the eventual system can evolve over

time," he said.

The need for evolving systems of greater sophistication parallels the end user's increasing knowledge about how to use the computer system. The first-time computer user operates at a disadvantage because he is not familiar with the computer's capabilities, but he usually has more flexible requirements, according to Martin. "Often, to a great degree, the first-time user can 'live' with the [unmodified] package."

The more sophisticated user may have more computer-related experience, but he also has "more closely defined requirements," he noted. These requirements often require software

changes to provide different — if not necessarily better — information to the end user, Martin said.

Since a "good computer package is user-defined," the software purchaser should also be provided with tools that allow him to modify his information data base, to query the data base for specific information and to report this data in a meaningful fashion, he pointed out.

This combination allows the computer user to have "the best of both worlds — a package solution to get the system up and running quickly and data base maintenance and reporting aids to ensure [that] the system can be enhanced in the future and its investment maintained," he said.

Specific Procedures

Martin recommended that the small to medium-sized manufacturing firm go through several specific procedures when selecting and installing a software package.

First, the potential purchaser must review the requirements and features offered by the package in order to learn how it works. After this review, the end user should "request modifications only where necessary, keeping in mind that more experience with the package will eliminate many modifications."

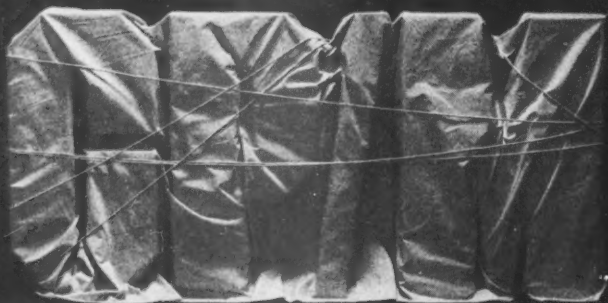
Next, the package should be installed in the various user areas with vendor-provided tools such as a data base modifier and/or report writer to handle special needs. "Once the package is running smoothly and users have become more knowledgeable [the firm can] move into more advanced information applications," Martin said.

Computer-assisted design and manufacturing (CAD/CAM) systems are examples of these more advanced applications, he noted.

CAD works through allowing the engineer to shape, test and cost a product design that is displayed on a graphics terminal, he explained. Once the engineer is satisfied, the system converts the completed design into machine-oriented instructions for the factory floor and the organization uses the instructions to drive the manufacturing process, he said. Manufacturers who have started with relatively simple administrative functions will soon be performing the advanced modeling and simulation applications now seen in large aerospace and automotive manufacturing companies, he predicted.

"The hardware and software technology is here to do it," Martin said. Now, the challenge is to develop and train knowledgeable workers who can make use of this technology, he said.

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'Chip! This Baby's a Chunk!'

SPECIAL REPORT

Page 11

Systems Software or Applications Packages?

Hazy Distinctions Cleared for Software Buyer

By Roy Horsey
Special to CW

HOPEDALE, Mass. — Software packages are classifiable according to such factors as price, function and vendor size, but the line between applications packages and "system software" has become increasingly less discernible. Certainly an inventory software package is generally accepted as an application, but can a data base manager or a polling package for cash registers be considered application software?

A more useful distinction for the application package selection process may be made between software from hardware vendors and third-party-supplied software. The reason for this division is that the software development process is different in the two environments. Although there is sometimes less quality assurance on third-party software, there is greater emphasis on unique problem-solving approaches. And keep in mind that the leverage you have on the vendor is much greater if it is also your hardware supplier.

The prospective purchaser buys software packages because he wishes to accomplish a specific function via the computer system and does not have the resources in terms of personnel, knowledge, training, time and/or equipment to write the software in-house. The wary customer should note that it is not always possible to save money by buying a package rather than developing it — packages can be costly to install.

Vendor Provisions

Elements that should be included in the vendor-provided package include:

- **Source Code:** Problems generally develop during installation which cannot be cured except by seeing the source code.

- **Documentation:** Vendors usually make extensive efforts to provide clear, adequate and complete documentation. The reason that the opposite often seems to be the norm may be that the programmers and analysts who actually wrote the software solved the bugs without documenting what happened and how it was fixed.

At any rate, I have not yet seen any documentation which was thorough enough to enable the buyer to install the package without vendor calls and reference to the source code. At a minimum, the documentation should contain a system narrative and system flow chart, a description of data, a description of purpose and use of every file and a program flow chart and source code listing for each module.

- **Object code:** Although this code may run in your environment, recompiling some programs may be necessary.

- **Training and installation support:** While this may be included with the more complex packages, a realistic appraisal indicates that the user will have to assume the burden of educating himself about the package if installation is to take place within a reasonable time frame.

The effort to install a package often

depends upon how closely your hardware and operating system fit the system upon which the package was developed. This match can be broken down into three categories:

- **Identical hardware and operating system** is the best combination. If the peripherals are different or it's a larger or smaller machine within the same model series, or your installation utilizes different features of the same operating system, extensive job control language modifications may be necessary.

- **If you have a different machine se-**

ries or different operating system that was developed by the same manufac-

The distinction between systems software and applications software packages is becoming hazy, according to Horsey. But certain steps should be followed by the prospective purchaser of any software package.

turer as that used by the software vendor, the situation can be described as

"fair." One possible source of help in this situation may be the hardware vendor that is common to both installations.

- **If both the hardware and the operating system configuration are materially different from those on which the package was developed,** chances for successful implementation are usually poor. In the real world, there are many incompatibilities between so-called "Cobol-compatible" systems.

One example of the problems that can arise in this type of situation was (Continued on SR/12)

Keeping pace with today's competitive business climate is a full-time, demanding job. The last thing your company needs under time-conscious decision-making pressure is a computer program that sometimes creates more problems than it solves.

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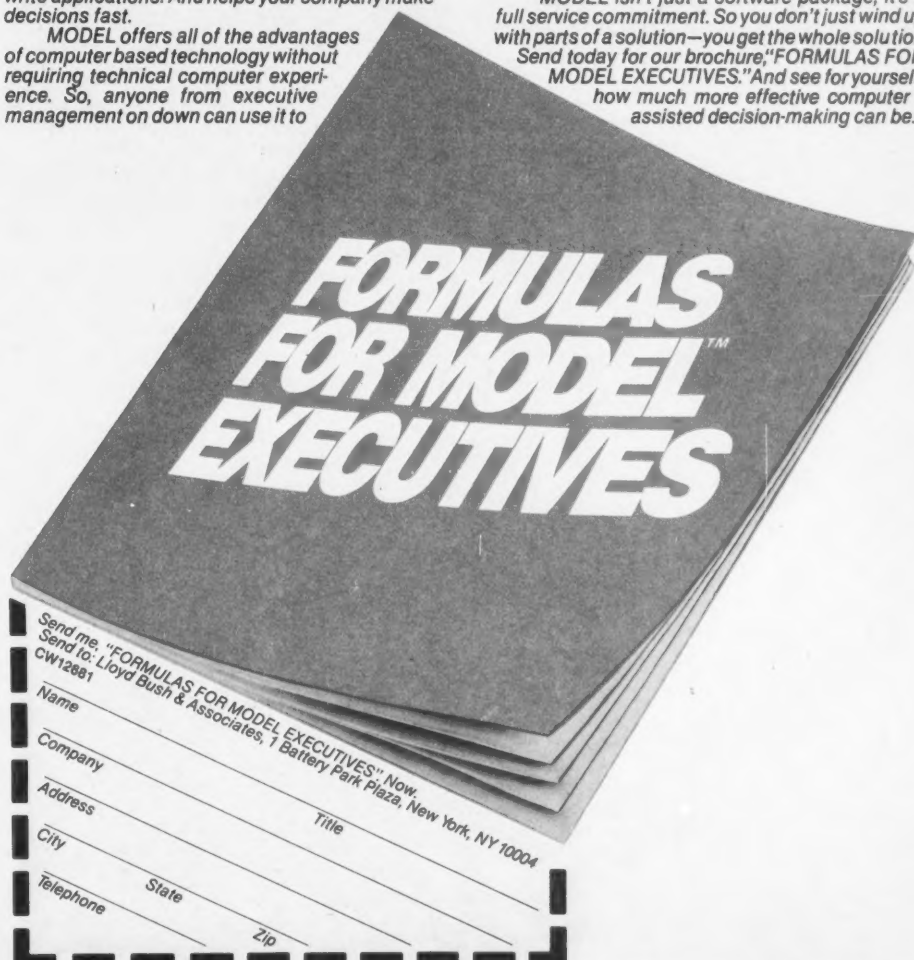
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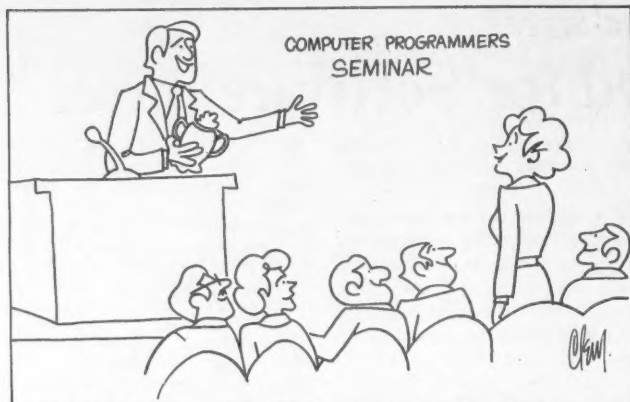
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SPECIAL REPORT

Page 12



'And to Ms. Camden, for the Best Acronym of the Month ...'

Hazy Distinctions Cleared

(Continued from SR/11)
provided by a DP manager who had to physically move the reflective strip at the beginning of each reel of tape exactly 2.5 in. so that the tapes could be read on another vendor's drives.

Selection Process

Once the decision has been made to purchase an applications software package, certain steps should be followed during the selection process.

First, establish a dollar value on the costs and benefits you expect to derive from the software. If payback will not occur within approximately one year, the purchase may not be worthwhile from a cost/benefit standpoint.

Basic business benefits to look for include an increase in profits or a decrease in costs. Benefits can also be reflected in the potential to handle greater sales or shipping volume, reduce inventory or reduce the float of money or goods.

Second, make a demonstration of the package for the end users who will be working with it on a daily basis. If this is not done, the end user may disclaim any responsibility when confronted by a schedule slippage or installation problem.

A detailed systems analysis of the software is the next step in this process. The purpose of this analysis is to uncover problem areas as soon as possible. There are five possible incompatibilities that may be revealed during the analysis:

- **System incompatibilities:** The package requires an environment with four disk drives and there are only three drives available or the package required 400K bytes of main memory and you wish to retain multiprogramming on your 512K-byte system.

- **Code incompatibilities:** The package may have been written with a compiler that allowed indexes to be set to zero and comparisons made between the index and a number that is outside the specified range of an occurring table. If this type of logic does not work under the compiler in your environment, programmers will be required to rewrite all table-handling routines.

- **Data incompatibilities:** Acceptable data formats can vary from vendor to vendor. For example, packed and unsigned data — a format which is one-half-byte displaced from the more familiar packed signed decimal format — is only acceptable to certain software developers.

- **File incompatibilities:** Determine if the file-handling capabilities in your system are identical to those assumed by the package. For example, software developed on a minicomputer system that includes just three file-handling instructions in its operating system — CREATE, ASSIGN and DELETE — requires considerable modification for a mainframe system that allows day, week and generation file dating.

- **Communication incompatibilities:** Factors include buffer sizes, communications protocols, cursor control recognition and appropriate modem and line selection.

Step four involves developing a detailed implementation plan that covers the data requirements, operational schedule and testing methodology.

After selection has taken place, the responsibility for installation should be assigned to one person rather than to a committee. That person will interact with the vendor, end users and technicians in order to keep delays to a minimum.

Implementation progress should be monitored closely with an emphasis on showing some progress on a daily basis. It is recommended that all package features be installed without modification so that the end user can work with them for at least a six-month period. At that point, any features which are deemed unnecessary may be deleted.

Horsley is a free-lance DP consultant who specializes in software package selection and installation.

To work well for Manufacturing, MRP* must also work on the computer.

When searching for an MRP system, many manufacturing firms reason that: "Only functional capability is important, not how MRP works on the computer."

This misconception frequently results in a manufacturing control system that is unable to achieve its functional capability because it cannot be implemented by data processing. Manufacturing therefore never quite gets the system they need, where they need it — "outside" the computer room.

The functional capabilities of your manufacturing system are very important. But, by also ensuring the system works well on the computer, you can be confident it will meet your manufacturing information needs today and adapt to your needs of the future. Then you can truly reap the benefits of MRP—with a lot less time and expense.

Along with "How MRP works on the computer isn't important," there are many other misconceptions that prevent companies from realizing the benefits of MRP.

Misconceptions such as: "Once we've implemented MRP, everything will be all right." Or "Some people might need MRP, but our problem is capacity planning."

At Cincom, we've put together a booklet of the "12 Common Misconceptions about MRP." This booklet will help you get a better grasp of MRP. Then you can come to grips with manufacturing control. We'll be happy to send "Misconceptions" to you. It's useful, and it's free. Write or call: Laura Larsen, Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, Ohio 45211, Telephone (513) 662-2300.



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SPECIAL REPORT

Page 13

Closer Look at Finances, Accounting Prop. 13 Pushes Oregon County to Revamp

ROSEBURG, Ore. — California's passage of Proposition 13 provided the impetus for Douglas County in neighboring Oregon to take a close look at its own financial and accounting systems.

"We were not pleased with the procedures that were being used for payroll, the processing time lag that prevented us from taking discounts when paying bills and the inefficient procedures used for keeping track of our multimillion dollar budget," Bill Vian, chairman of the County Board of Commissioners, recalled.

"Our systems were completely antiquated and we decided that we had to do something about them," he said.

The "something" began with engaging the county's auditing firm, Lippold, Brenner & Bingenheimer (LB&B) to conduct a detailed review of the existing financial and accounting systems.

Problems Identified

Problems identified within the audit report included the need for a general ledger system, which was resulting in a lack of balance sheet accounting and asset control, the need for accrual basis accounting for the county, and inability to determine the current cash position at any given time and a lack of timely budgetary control over appropriations and expenditures.

In addition, problems in the treasury and cash management functions were resulting in lost investment income, Vian noted. There was no automated accounts payable system and manual journals were used to duplicate work already done in the DP area, he said. Cash receipts were processed manually and a "true receivables" position was "difficult to determine."

"The county's payroll accounting was archaic. The old systems were obsolete, cumbersome and inefficient. There was nothing that could be called a management information system," Jerry Schroeder, project manager for LB&B, noted. "As auditors, we had major concerns for the continued fiscal responsibility of the county in light of growing public and regulatory awareness."

The immediate result of the study was a two-day session involving all of the elected county officials, all county department heads and representatives from LB&B. "That meeting [in May 1979] underscored just how antiquated and unwieldy our systems were," Vian stated.

Objectives Set

Objectives were set to automate the general ledger function, which included financial statements and a standard chart of accounts, to implement expenditure control and encumbrance accounting, to integrate trust and other funds into the accounting process, to establish cost and responsibility accounting procedures and to provide the ability to handle projects and program accounting.

Participants also set an immediate requirement of an on-line accounts payable system to interface to the general ledger system and an on-line accounts

receivable system with receipts registers and receivables management that would interface with the existing billing systems.

A project team was assigned the task of determining the economic benefits of the project systems and the expected benefits were calculated to be \$1.3 million annually, Vian said.

The same team decided that the financial application software should be acquired from outside vendors rather than developed inhouse so that the county's needs could be met in a timely manner.

Five vendors were reviewed in detail and three of these were asked to make formal presentations. The team also visited user sites for two of the vendors, and when the various criteria had been evaluated, financial software from Management Sciences America, Inc. (MSA) was selected.

"Insofar as the selection process went, it is important to note that this was a collective effort that included a number of key users and future users of the systems," Elton Szpaller, manager of DP, pointed out.

"Each person voted individually on a

per-item or per-feature basis. As such, the selection was not a process to simply satisfy DP criteria and expectations nor to engage consultants, but to find the best user-oriented system that would meet most of the users' needs," he said.

Systems flexibility, integration of the human resource and financial information applications and a satisfactory record of support were among the factors that led to MSA's selection, he said.

The potential benefits from the new
(Continued on SR/14)

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SPECIAL REPORT

Without Right Software, CPUs Just Dead Metal

By Steven D. Bell

Special to CW

REDLANDS, Calif. — The single most important consideration after deciding to acquire a computer is choosing the application software that

will run on the hardware. Without suitable software, even the best computer is just dead metal. Most first-time users, however, are not aware of this fact. The result can be a system that does not perform

to specifications.

Ideally, the time to consider application software is before

environment. But the exact fit entails the commitment of more time and money than an

And modifications may be completely impossible with vendor and turnkey packages.

Software costs can come as a surprise to the first-time user. A quality application software package will generally cost from 50% to 100% of the hardware purchase prices, and custom-designed software can be more expensive. These percentages will probably go up as equipment prices fall and personnel costs increase. The availability and cost of continuing software maintenance must also be considered if the user has no in-house DP technical staff.

Professional help in acquiring application software is available to the first-time user from several sources. An experienced programmer/analyst can be hired on a project or on a permanent basis or a DP consultant can be retained. The user should be wary of low-cost "consulting" services from a software vendor which may be little more than a sales lead-in.

Bell is a consultant with Integrated Management Systems, a firm that specializes in small business systems and software.

After making the decision to automate a manual system, you face the equally crucial choice of where to get the software that is right for your installation. Bell points out the advantages of several acquisition alternatives for first-time computer users.

selecting the computer equipment. While hardware vendors extol the virtues of their bells and whistles, the prudent businessperson should realize that the successful implementation of an in-house system depends on the software.

There are several methods of acquiring application software for the first-time user. These include custom development, off-the-shelf software packages and combined hardware and software packages or turnkey systems. Each method offers its own potential benefits and problems.

While custom-designed software is usually more effective in the long run, initial costs can be high. Properly designed and implemented custom software can provide an exact match to the existing business

off-the-shelf version. This is true whether the software is developed in-house or by an outside firm.

Off-the-shelf application packages can be obtained from hardware vendors, turnkey OEMs or independent software houses. These packages can be less expensive initially because development costs are distributed to many users. The packages are usually well tested and eliminate user debugging. In addition, the installation time is often considerably less than that required to implement a custom-designed system.

The main disadvantages of off-the-shelf packages hinge on the lack of flexibility. Relatively inexpensive packages can become costly if the user requires system modifications.

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Oregon County Revamps Systems

(Continued from SR/13)
systems made it possible to justify a hardware upgrade from an IBM 370/125 Model 0 to a 370/125 Model 2, and disk capacity was increased by 75%, according to a spokesman. In addition a Model 148 was delivered in March 1980 and is running with thirty on-line terminals in a VM/DOS environment with CICS and DL/1, he said.

System Implementation

Implementation of MSA's general ledger and accounts payable packages was accomplished in approximately 10 months, he noted. The systems were installed by a team of financial users with project management assistance provided by LB&B.

Although the elapsed time exceeded the original county estimate, total manpower requirements were less than anticipated, according to a spokesman.

Since the MSA software was primarily implemented by the users "without significantly impacting my systems and programming department, we were able to devote our efforts to other systems," Szpaller noted.

"For example, we upgraded our assessment and taxation system to on-line and DL/1 status, implemented an on-

line health department immunization system and installed the assessment and taxation system via remote terminals in an adjacent county," he said.

"The tax assessor indicated that he would need fifteen more clerks if he had to go back to a manual system," Sz-

paller said.

Future plans include the installation of MSA's fixed assets accounting system and supplies inventory control and purchasing and accounts receivable packages with on-line capabilities by the fourth quarter of 1981.

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SPECIAL REPORT

Keeps Small Bank in Business

Package Justified Despite 3,000-Line Update

VENTURA, Calif. — Despite a "little update" to an applications software package that required some 3,000 lines of new code, program packages are the "way for the small branch bank to stay in business," according to R.T. Shimer, a DP consultant here.

Shimer was called in by a California county bank to evaluate various financial packages designed to handle a certificate of deposit (CD) application.

Although a CD package was currently installed at the bank, he indicated that "it had never been worth the \$300 paid for it" and eventually selected the CD3 applications software from Florida Software Services, Inc. (FSS) to replace it.

Since a similar package had recently been installed for a mortgage loan application, Shimer's team felt that the CD3 installation would be straightforward. This led to the group agreeing to perform a "little update" to the recently released CD3 package.

The result was 3,000 lines of code that affected every program in a system that included more than 100 modules, he said. The new code also required modifications to approximately two-thirds of the record formats within the system, he noted.

Source Code Update

Although the update was accomplished in 10 weeks, it involved matching all source code line numbers manually and recoding all of the source updating procedures, according to Shimer.

The CD3 Cobol modules were set up with Applied Data Research, Inc.'s Librarian package, he explained, while the bank's source library maintenance system was Panvalet from Pansophics Systems, Inc. Differences between the two maintenance packages made the manual updates unavoidable, he said.

After testing and operations documentation were completed, conversion and cutover were assigned to one operator who was able to control the schedule on either a single or a multiple-branch basis, he said.

The package provided the bank with the ability to define several hundred different types of certificates and this allowed the firm to vary interest rates and terms to meet its own requirements, he said.

The contract called for Shimer's group to operate as a service bureau because the bank was too small to support its own computer center, he said.

Code Tailoring

FSS provided a full set of "production-ready" DOS JCL for IBM 3330 disk packs. Since 2314 disk packs were being utilized, both JCL and program source code tailoring became necessary, he pointed out. This type of change becomes fairly complex in a DOS environment with indexed sequential Isam files, the consultant said.

He also felt that FSS "must have had very few users without floating-point hardware," because the code involved floating-point formulas. Since floating-point hardware was unavailable to the California group, FSS at-

tempted to document the required changes. However, at least one program would not compile because a floating-point formula had been overlooked, he said.

Although Shimer's operating system environment was "a kind of bargain variety MVT," no problems were encountered in the applications package/operating system interface.

While it was difficult to come up with definite figures for a cost/benefit analysis, the consultant felt that his client received "full value" from the FSS package. Initial purchase price

was approximately \$17,000 and annual maintenance cost is between \$2,000 and \$3,000, he said.

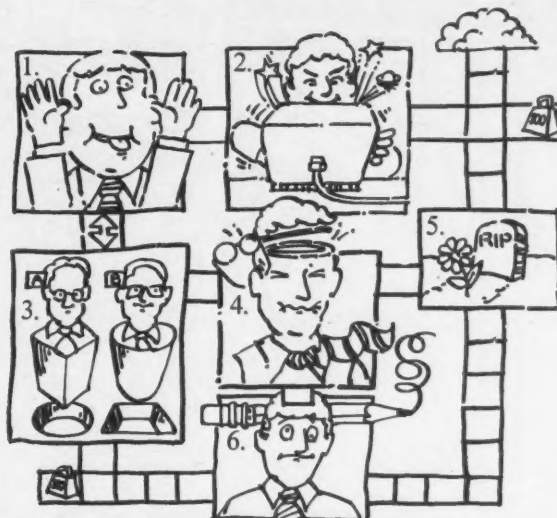
This cost is justified by the "collective security [the software] provides in the face of rising concern over increasing regulation complexity," according to Shimer.

If provided with the opportunity to perform the same type of package evaluation and selection for another client, Shimer described the need for some changes in the relationship between the software development firm and its customers.

First, the programmer/analyst who is to install the product should visit multiple user installations and be invited to attend user meetings, he said. In addition, the small bank end-user must be prepared to accept analytical activities and decision-making from a technical programmer/analyst even when these appear to overlap areas formerly controlled by bank officers.

Finally, it is the software developer's responsibility to encourage a close relationship with the customer's technical specialist, he said.

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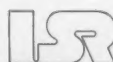
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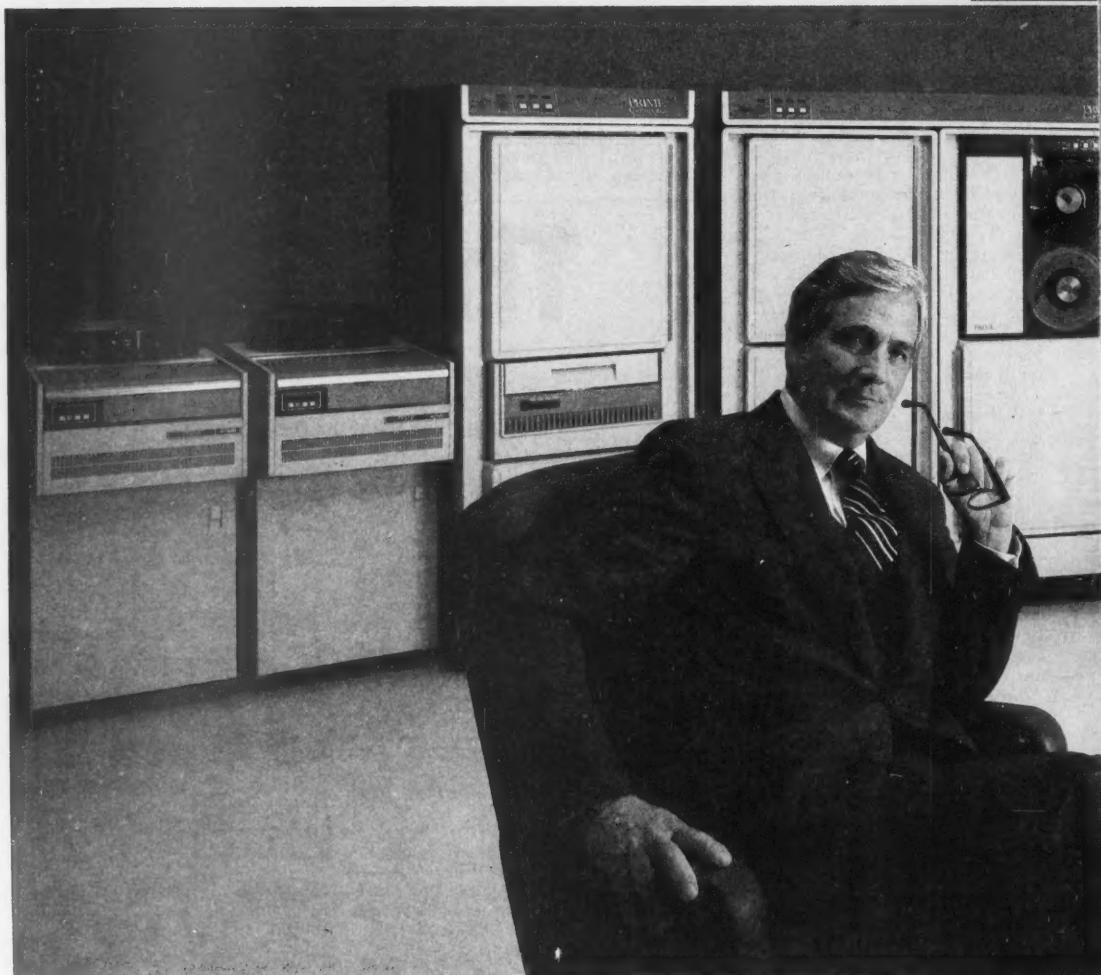
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SPECIAL REPORT

Page 18

Laboratory Software Revives Hospital Revenues,

LYNCHBURG, Va. — Faster and more accurate test reporting, improved laboratory productivity and an estimated \$60,000 annual increase in revenue from recovery of lost charges resulted from installing IBM's Laboratory Data Management System (LDMS) at Virginia Baptist Hospital here.

Automated billing is recovering approximately \$60,000 a year in charges that were lost under the manual system, according to Gene Davis, chief medical technologist. "We've more than offset the cost of the system. By the most conservative estimate, we've saved thousands of dollars more than the system has cost us."

LDMS is also proving cost-effective in terms of improved productivity and better utilization of laboratory personnel.

"Our productivity has increased considerably since we installed LDMS," Davis observed. "Using the work-load recording system of the College of American Pathologists, we've set a target of 55 productive minutes per hour of work. With LDMS, we've gotten as high as 119% of that, better than 60 productive minutes per hour."

The system has also enabled the laboratory to absorb a bigger work load without a corresponding increase in personnel. Since 1976, the year before

LDMS was installed, the laboratory has absorbed a 30% increase in test volume with only three additional employees, a spokesman said.

Growing Work Load

Virginia Baptist's experience with LDMS shows that small and medium-size facilities can benefit from computer-assisted lab systems previously found only in larger hospitals, he said. Laboratory test volume at the 313-bed acute-care hospital has increased an average 20% a year over the past five years, and the laboratory performed more than 730,000 tests during the previous 12 months, he pointed out.

As the test volume grew, so did the clerical work load. Errors inherent in a manual reporting system began to increase, problems with accountability arose and responses to inquiries slowed, he recalled.

LDMS appeared to be a possible solution since it helps manage lab data for all tests performed from the time a patient enters the hospital until the patient is discharged. Test orders and results for major laboratory sections may be entered on-line through CRT terminals, the spokesman said.

Entries for orders and results are made either by menu selection from a display screen or by keyboard. To enter orders on the screen, a terminal operator touches a light pen to desired test names and assigns a status to each test, he explained. On completion of an order entry session, LDMS displays a summary screen listing all tests that have been ordered for final review by the operator.

Specially formatted screens for various test types allow the operators to fill in the blanks on each screen, and the laboratory organizes these on-line operations around four terminals, he said.

Systematic Listing

Since a typical patient at Virginia Baptist has about 60 laboratory tests during a hospital stay, it is critical that the results be reported in a readable, reproducible, well-organized format that is meaningful to physicians.

"The [LDMS] cumulative summary gives all the laboratory results in a systematic listing. The name of the test is at the top of the page. All the results for a given test are together, sorted vertically by date and time. The physician can review the patient's entire hospital stay at one glance," Dr. James Piggott, pathologist, explained.

"Under the old manual system, the reports weren't really cumulative. If a

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new result became available, there was no way to put it ahead of the old one that had already been charted. Now all the results for a given test are in one place, rather than being scattered on different pages," he said.

The information contained in the cumulative summary report is updated by interim reports that contain results of all tests completed since the last cumulative report was run, Piggott noted.

An additional reporting advantage of LDMS is faster response to inquiries regarding test results that haven't been charted yet. Instead of the 10 minutes formerly required for laboratory personnel to locate results, on-line inquiry is accomplished in a few seconds, according to a spokesman.

Clerical Burden

The laboratory was running more than 50,000 tests each month prior to LDMS installation in 1977. "We could barely handle the clerical work. Everyone was transcribing and charting. Our error rate was becoming uncomfortable and we had problems with accountability. We couldn't tell who transcribed what or at which point the error occurred," Davis recalled.

"With LDMS, it's possible to inquire at a terminal and learn, in seconds, who ordered a test, who performed the analysis, who entered the result into the computer and which technologist verified the result, as well as the time of each clerical transaction. There's an audit trail that is very helpful," he said.

In addition, it was formerly possible for a test result never to be recorded on a patient's chart, and for laboratory personnel not to know it until it was called to their attention by a physician, he said.

"LDMS handles this problem very effectively," Davis said. "Once you order the test in LDMS, the test is there. If you don't put a result in, the order comes out on an overdue work list."

The software also permits several reviews of test results. "We had an archaic system of reporting our results, manually transcribing them onto the charts. There were too many errors. And the results could never be checked again unless someone questioned them," according to Piggott.

"LDMS allows a review of all the results that have been put into the system," he said. "If results are put in by a clerk, they have to be reviewed and verified by a technologist before they become available. The next day, when the old work lists are published, they can be reviewed by the section supervisors and then by the pathologist. By the end of today, I'll know everything that went into the system yesterday."

The applications package allows laboratory technicians to spend less time on clerical tasks, Robert Mills, director of management services, said. "LDMS has proven cost-effective. It's enabled us to better utilize skilled technicians in their work area. These are valuable people who should be doing lab work rather than shuffling papers or hand-posting reports," he noted.

Since laboratory test results must, by law, be kept for varying lengths of

time, filing and storing patient information can be a prodigious clerical task. "You can do really well alphabetizing and filing 100 laboratory results and you can do fairly well with 1,000. But when you're dealing with 750,000 test results a year, just filing them is a tremendous task," Davis explained.

However, filing, storage and retrieval of test results is an automatic by-product of daily system usage with LDMS, he said.

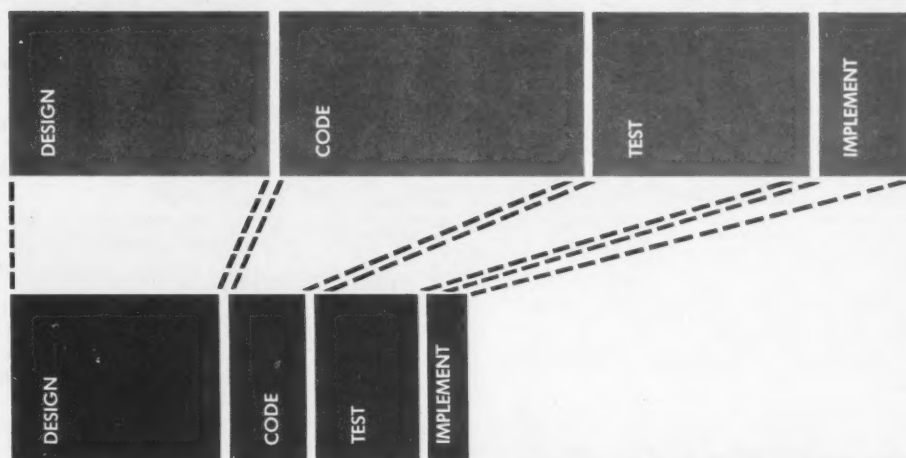
Organizing the daily work load has also been streamlined via LDMS, a spokesman said. Its work organization facilities allow users to plan and moni-

tor all test operations within the lab. For example, the system accumulates and organizes order entry information to generate both a daily specimen collection schedule with its corresponding specimen labels and nursing station lists of all patients on the collection schedules, he said.

"We know at a glance how much lab work we have," Kay McDonald, lab technologist, explained. "We know what tests will be run before we get the specimens. Before we had LDMS, two people would take the request slips in the morning and write out the work lists. Later, we'd have to shuffle through the work lists for results and

transcribe them to the request slips, which were then taken to the floor and the results transferred to the patient chart.

"One of the biggest advantages of LDMS from my standpoint is that it doesn't take a whole lot of ongoing effort on the part of the DP staff to keep the system running," James Seftor, director of DP, observed. "All the data is entered on-line by the lab personnel, so I didn't have to increase my data entry staff. Our main support effort is with the Batch Reporting portion of the system. The required programming and systems support is minimal," he said.



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SPECIAL REPORT

Package's Integrated Design Attracts Boeing Managers

WINNIPEG, Man. — Integration between terminal-oriented processing, application modules and a central data base was a key factor in the selection of NCR Corp.'s Manufacturing Information System Support Integrated On-Line (Mission) System for the Boeing Corp. facility here.

J.D. Martin from DaTech, Ltd. worked with Boeing management to select an appropriate software package for the plant (see story on SR/21).

Mission's design can be envisioned in terms of a circle with three rings of interlocking gears, Martin said. With this integrated design, the turning of any gear in any ring can set all gears in motion, so the system has a strong potential for improving coordination in an organization, he claimed.

The circle's outer ring holds NCR's Tran-Pro and data dictionary software, Martin explained. Designed to simplify terminal communications, the software allows appropriately trained terminal operators to communicate with the system with English commands.

Boeing management can also use Tran-Pro to determine the functions to be performed on each terminal and to assign passwords that permit individual employees to handle selected functions, he noted.

Application Modules

The design circle's second ring contains 11 application modules. These modules feed in information and extract data from the central data base, or core ring, to perform specific tasks, Martin explained.

Since the manufacturing application modules are interactive and often function in unison, he found it difficult to describe individual module functions. However, brief definitions of module functions help in understanding the scope of the software package, he said. These functions include:

- A bill-of-materials system that identifies all assemblies and subassemblies for each manufactured part and notes the interrelationship among parts. The system can keep track of past and future product structures for on-line inquiry and planning purposes as well as current structures.

- A material management system that provides control over physical inventory from the time materials are received until they are consumed in manufacturing or shipped.

- An inventory management system that provides financial inventory control including transaction registers and reporting figures.

- A material requirements planning system that uses bill-of-material product structures to explode production plans. During this process, inventory status in the material management system is examined to determine quantities of items needed and when they are required.

- A routing system that is the labor bill of material; it details how each part or product is built. Like the bill-of-materials module, it serves one or more other modules as a key information

base. For example, the routing system has the essential labor information needed to run the capacity planning system.

- A costing system that provides control and monitoring of product costs by compiling average material and labor costs through bill-of-material and routing systems.

- A work-in-process system that enables the plant to release manufacturing work orders and to track them through to completion.

- An order processing system that tracks customer orders through the plant from entry to shipment.

- A purchasing system that is used to enter and release purchase orders and to analyze vendor and shipper performance.

- A capacity requirements planning system that compares results to capacity after examining projected workload.

- A master production scheduling system that enables the plant to establish a realistic master schedule. It also permits management to generate simulated models that help with strategic planning.

All of these modules result in a closed-loop system, Martin said. All functional areas of the organization are tied into the master production schedule, which becomes the axle around which the machinery of production revolves. Because the system functions in an on-line, real-time mode, up-to-date information is available

(Continued on SR/22)

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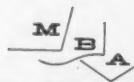
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SPECIAL REPORT

Page 21

For Manufacturing Control

End-User-Developed Tool Put to Work at Boeing

WINNIPEG, Man. — Who would be the logical developers of manufacturing control application software? One good answer might be the end users within the manufacturing departments who must satisfy control and production requirements from multiple plants, according to J.D. Martin, marketing manager for DaTech, Ltd.

DaTech, a DP service and consulting bureau, was called in by Boeing Corp. management to develop a program to improve the Winnipeg facility's communications network.

Boeing management wanted an economical way to cope with its complicated product structure problem and maintain tight control over manufacturing, Martin said. "The plant previously had operated entirely on manual systems, and management knew that replacing these highly intricate and scientific manual methods would not be easy. The timeliness of information rather than its accuracy was the major problem," he noted.

After DaTech researched a variety of software options and system alternatives, it selected NCR Corp.'s Manufacturing Information System Support Integrated On-Line (Mission) system. Since Mission was an on-line, real-time, transaction-oriented system, it provided the timeliness Boeing sought, Martin said. Flexibility and proven performance also weighed favorably in the selection process.

"I don't think I can overemphasize the importance of the fact that Mission was developed over a period of years by managements at several NCR manufacturing facilities to meet their individual and combined needs," he said. "I think the system's flexibility and the ease with which it can be adapted to satisfy different companies' requirements is largely due to its development history. It was designed by manufacturing users to satisfy the requirements of a number of plants."

The 650-employee Boeing plant has the same type of communications and interaction pattern as most manufacturing facilities, according to Martin. Coordination and rapid interchange of information are essential if the plant is to take into account hundreds of factors from changing product bills of materials to capacity limitations to produce sophisticated products efficiently at the lowest possible cost.

New Communications Picture

Now that most modules in Mission have been brought up, the plant's communications/interaction picture resembles a wheel, Martin said. A department or production group at the end of each wheel spoke can input or access information directly from the data base hub of the wheel. If factors in one department change, affected groups know at once. For example, if engineering proposes to change a product's bill of material in six months, the new product configuration automatically is figured into advance purchasing requirements.

One of the major strains on manufacturing facilities is caused by product changes, he said. "And product structures have much shorter life spans as

companies attempt to seize the opportunities presented by new technology and altered market demands. Directly or indirectly, every functional group in a manufacturing organization is impacted by product structure changes."

In a static environment, manufacturing can use historical data to project what quantities of raw materials must be ordered now to meet manufacturing requirements in six months. But if old products are replaced by new ones and structural alterations dictate different subassemblies and routings, historical data has little value, Martin noted.

Complex product structures complicate explosion procedures to determine lowest level needs for material requirements and work center planning. As a consequence, an organization that tries to manually feed change information through its network is always working with outmoded plans or inaccurate data, he said.

Boeing constructs some aircraft body assemblies of fiberglass and other high-strength materials. The plant manufactures 4,000 component parts and purchases another 8,000 parts and raw material products, each of which

may be used in a variety of subassemblies. To complicate matters, two- to six-month life spans for product structures are common.

By the end of 1981, between 24 and 30 on-line NCR 796-301 and 796-501 data terminals located throughout the manufacturing facility are expected to link managers to the system. Some eight terminals are currently tied to an NCR 8550 computer located at DaTech headquarters some 10 miles away. The Mission package runs in a 512K-byte partition in a B-3 operating environment, Martin said.

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SPECIAL REPORT

Page 22

Minimal Organizational Impact

General Mills Adapts Ledger Package With Ease

MINNEAPOLIS — Minimal organizational impact, particularly in the programming area, was a General Mills, Inc. requirement when shopping for a general ledger package, according to Rod Dachel, manager of financial systems development for the Consumer Food Group.

The firm settled on the Corporate General Ledger (CGL) package from American Management Systems (AMS) because "of all the software systems we examined, CGL had the least impact organizationally."

"Existing accounting personnel were

trained to operate it and there was no need to use additional computer programmers. We even reduced the accounting staff by one," Dachel said.

The package provided compatibility with the Basic General Mills account code and was easily tailored to handle three additional modifiers the firm utilizes for reporting clarity, he noted.

"In addition, the system is able to define file attributes and utilize infernal capabilities of predefined tables," Dachel pointed out. "Minimal input data is validated against the predefined tables and internally expanded

through an infernal process." This eliminates the requirement for additional input, saves time and reduces erroneous entries, he said.

The package was adapted to the entire General Mills environment, Dachel continued. "Presently we have 22 systems feeding transactions into the system on an automated basis, including sales, payroll, accounts receivable and production. Installation required no change for these and other feeding systems." Since it is responsive to accounting changes CGL offers the company extensive expansion ca-

pabilities, Dachel added.

Some of this adaptability may be traced to CGL's procedural language, an AMS spokesman said. While packaged accounting systems often include report writers so users can define reports in accounting terminology, AMS opted to include a language that allows the user to specify editing rules in accounting terms.

"To date, we have used the system to process the 1979-1980 fiscal year accounts providing a complete set of historical data used for tracking. Our 1980-1981 fiscal year began in late May and we have successfully processed the June through current business in the system," Dachel said.

CGL is currently being used for the Consumer Food Group, which is the largest business segment of General Mills, as well as by the James Ford Bell Corp. and the Corporate Staff Activities. "We are also using it to consolidate all domestic and foreign entries for General Mills, and future plans provide for the possible addition of some domestic detail ledgers within the system," he continued.

Compatible with distributed processing networks, CGL is available in versions for IBM 370 and Digital Equipment Corp. computers. The firm provides on-site training, conversion consulting, documentation and a user-advised enhancement program with each installation, a spokesman said.

Gary W. Hedge
V.P. Marketing,
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Package	Approx. Availability Date
General Ledger	1st Quarter, 1981
Payroll	1st Quarter, 1981
Accounts Payable	2nd Quarter, 1981
Sales Analysis	2nd Quarter, 1981

Because MCBA supplies source code and complete documentation, HP OEMs, Third Parties and users will find these applications easily installable and modifiable. Each package has its own data base except O/E which uses an expanded A/R data base. Full use of HP's QUERY facility is made possible. Rather than employ HP's VIEW, we have written a character mode screen I/O sub-routine which allows for interactive data validation on a field-by-field basis. This speeds data entry by interactive access to the data base and allows use of all 262x and 264x terminals.

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Integration A Key Factor

(Continued from SR/20)

able for the planning process. The system also alerts management to exceptional cases by pinpointing areas in which there are deviations from the plan.

"Users aren't constantly attempting to balance interrelated files or haggling about what version of the truth is accurate. Of course, the data base management approach also makes the system more efficient, since redundant data does not need to be stored in a series of files," he observed.

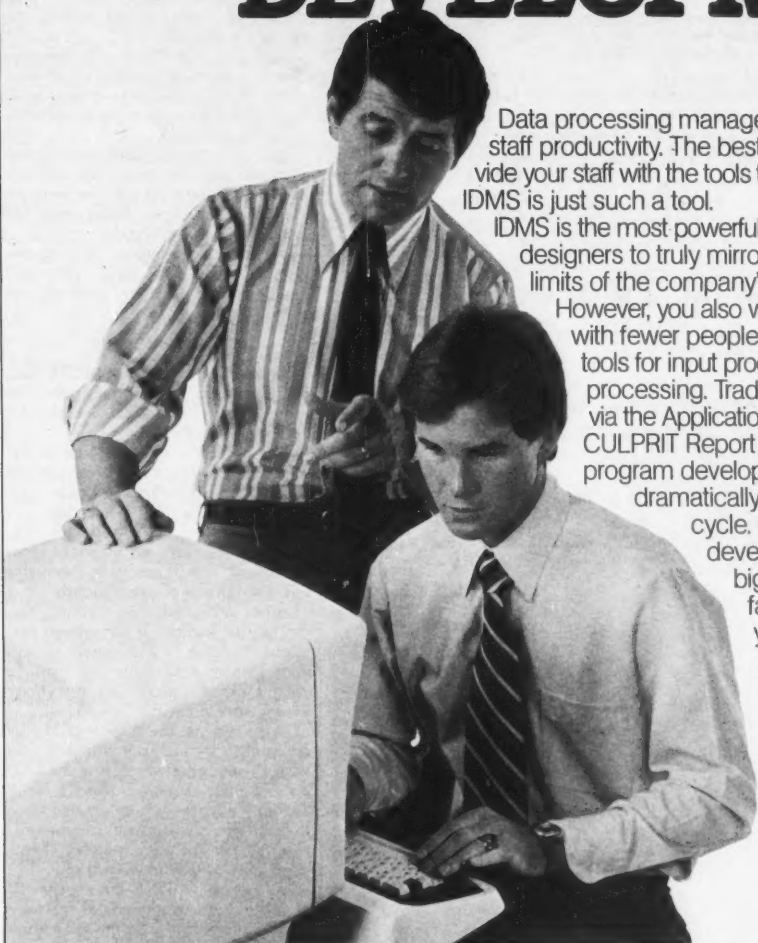
Mission's modular structure enabled Boeing to implement the system in an organized, logical fashion, Martin said, and disruption to the organization was minimized.

Training manufacturing employees to use the system has proven easy. It takes about two days to teach a novice how to enter data and make inquiries on-line. But because of the system's standardization, the same user can learn to work with additional modules in about a half hour, he said.

Martin indicated that the Boeing implementation began with the establishment of engineering product structure files and the introduction of bill-of-material, inventory management and material requirements planning modules. Now Boeing is addressing the labor side of the equation. It has established variable work center routings for most products. Total implementation of the master production scheduling module will be the last step.

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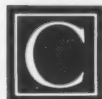


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CW/JAN 26

SPECIAL REPORT

Page 24

CPA Firm Finds Tailored Software Best Option

HOLLYWOOD, Fla. — What does a certified public accounting (CPA) firm look for when selecting accounting software packages? "A software vendor that understands the theory of accounting," according to Leroy Koross, a partner in Pollak, Zoller, Koross and Reiss (PZK&R) here.

The firm had used a service bureau for some 14 years, but "we were limited in the services we could provide our clients and outgrew the usefulness of our service bureau," Koross stated. "We had reached that point when other firms had caught up with us in the processing services they offered their clients. In order to stay ahead

competitively, we needed to provide our clients with additional services and provide a better turnaround.

"When we found that we were paying the service bureau more than the cost of an in-house computer, we decided to see what was available in the marketplace," he said.

After a one-year study of computer manufacturers and software vendors offering products for accounting firms, he selected an IBM System/34 with software from Atlanta-based Management Control Systems, Inc. (MCS). "Since MCS was started by accountants, their thinking was the same as mine," he said.

For example, the programs were designed for accountants rather than being available to accountants as well as manufacturers, contractors and others. "The packages allow us to provide services such as financial statement preparation, payroll checkwriting, accounts receivable, loan amortization, depreciation schedules and 1040 tax returns to our client base," Koross said.

"We use the MCS practice management and due date monitoring systems to assist us in managing our firm. These programs were designed according to the workflow of accounting firms and enable us to maximize the

productivity of the PZK&R staff," he continued. "Our software fills the specialized needs of a profession where services are so calculation-intensive that DP is a natural."

The company's cash flow improved immediately after package installation. Collections doubled during the first month of computerized billing, according to Koross.

Aged accounts receivable information is printed at the bottom of each statement. "I had clients call and apologize that they were in the 90-day column," Koross said.

Prior to computerization, the company sent out bills each month and clients didn't know where they were, he explained. So, they didn't treat the firm as a "regular" vendor.

The work-in-progress balance has also been reduced because all time and charges are billed monthly, Koross noted.

Fast Turnaround

Processing time with the MCS Financial Reporting System reduced turnaround time from four or five days to 24 hours, Koross said.

"Besides using the computer to bill our clients every month, we provide accounts receivable services [to them]," he said. A typical client for this service would be a doctor who cannot cost-justify an in-house computer and wants accounts receivable billed at the end of every month.

Koross indicated that training was the key to successful conversion and implementation. "You must commit your firm to education. Once you've got the system, make sure everybody knows how to use it," he said.

Conversion to the new system was accomplished in approximately six weeks — and that was during the middle of tax season, Koross said. Monthly clients were automated first, then quarterly clients as time permitted. All of PZK&R's regular clients were on the system by April 30.

The key to avoiding the expense of an in-house programmer was software vendor support, Koross noted, adding that the response time for getting answers to software questions is sometimes as rapid as a few minutes, depending on problem complexity.

And "we have had very few problems with the System/34. Response time from IBM is usually less than an hour," he estimated.

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SPECIAL REPORT

Page 25

Users Must Share Responsibility

Three Steps Can Help See Projects to Fruition

By Frank Mann

Special to CW

NEWTON UPPER FALLS, Mass. — There is no such thing as an "average" application package. If it works, it's a significant achievement — but if it doesn't, it's trash.

Who is the culprit if there is a gap between the user's expectations and the applications package and the gap isn't detected until late in the game?

While it is easy to say the fault lies with the software supplier, making a package work is a shared responsibility, with the end user's role as important as the vendor's.

There are three ways to assure that a package functions effectively, and two of them occur before programming begins:

- Have a comprehensive design study performed by the software house before the project begins.
- Read the study when it is completed.
- Let the software house work on-site.

Worth the Cost

The design study is an easy way to short-circuit potential misunderstandings between end-user and vendor personnel. It describes in the user's terms what the package should do and how it should be done. Since a significant amount of research and preliminary system analysis goes into the study, it may add a small amount to the total cost. However, it can be regarded as a low-cost insurance policy for saving money by eliminating fundamental misunderstandings.

What happens, for example, when a prospective client asks a software vendor for an accounts receivable package?

The end user may define accounts receivable as the entire billing operation, including order entry, order processing, inventory control, sales commission breakouts and any of 100 other items taken for granted in the user's business. But the systems analyst may regard accounts receivable as nothing more than posting and tracking money owed.

This kind of misunderstanding happens more often than people are willing to admit.

A typical design study requires several days to several weeks of systems analysis, depending on the scope of the project. In addition, the user's staff must supply operating details. More time is necessary to generate the formal document. But when it is done, the project's requirements are spelled out and the user has four clear options:

- The user can determine that the specifications are right and the price is fair. Barring other complications, the package should be installed.
- The project can be stopped if the specifications are right, but the price or the people assigned to the project are wrong. Since the user owns the study, it can then be used as the basis for proposals from other software suppliers.
- If the project is stopped because of a high price tag, the study has saved the user from investing in a project

Implementing an applications package successfully involves substantial commitment from the customer as well as the vendor, according to Mann. Whether you are commissioning a consulting firm to develop a tailored package for your installation or considering the purchase of an "off-the-shelf" package, Mann has three suggestions for effective application program implementation.

that could not be completed. When more funds are available, the specifications and data can be used for new bids.

- Since the user can see the full project scope, he may opt for a phased implementation. The study remains a good investment because the data and

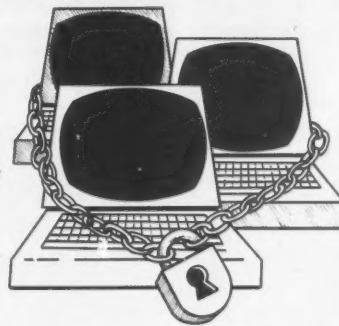
specifications assure the project's continuity even if it is implemented at intervals by different organizations.

If a study is commissioned, the user should naturally read the study and comment on it. However, design studies are detailed and lengthy and can intrude upon a busy manager's time. A typical study would contain six sections on the system's operation:

- A description, in the user's terms, of what each application or program module will do.
- A CRT screen layout section

(Continued on SR/26)

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A Foreign Oil Company

We evaluated the competition and chose ACEP.

An Oil Company

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A Major New York Bank

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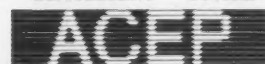
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SPECIAL REPORT

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Bankers Give Positive Accounts of 'IPS-One'

More than a dozen New England Banks have installed RCT-11's IPS-One package on Burroughs Corp. hardware and results are positive, based on an end-user minisurvey.

The package, which features multi location terminal capability, comprehensive editing and a settlement technique at transaction, batch, block and run levels, is an on-line document reject correction and settlement, according to one of its initial users.

"The most unique capability is the chase mode — we correct rejects on an open run with the system," George Conley, vice-president of Shawmut Community Bank in Framingham,

Mass., said. "We can overlap our activity on the sorter-reader with the correction and settlement effort on the same run, and prove the bank much earlier."

The in-place correction also provides accurate float and item counts that are important to the balance-conscious corporate customer base.

"Our Burroughs B1800 was delivered on Saturday and we corrected our in-clearing on Monday. Although we retained our manual procedures, just in case, the staff now wants no part of the old system," Paul Shea, vice-president of Safety Fund National Bank in Fitchburg, Mass., commented.

"We were an early user of the system," A.J. Joyal, DP manager of the Vermont-based Randolph National Bank, added. "We anticipated the usual bugs of a new system, but were pleasantly surprised."

"Since we service several other banks, rapid throughput is necessary for us to make deadlines. Even with four or five terminals active, we experience minimal degradation," he noted.

RCT-11, the IPS-One development house, is a three-year-old firm staffed entirely by former bankers. Craig Reynolds, director of systems development, initially identified the need for a reject correction and settlement pack-

age while working with an early version of a Burroughs program product. "We have been through two release levels with no problems to speak of," he claimed.

Although utilizing most of the special features of the Burroughs TD830, the system also runs on TD800- or TD820-style terminals, he said.

Features include the creation of special "slow letter" reports for corrected transit items, optional automatic cursor positioning, a system log containing operator statistics and a demonstration/training package for new users.

Three Steps To Success

(Continued from SR/25)

describing screen formats and detailing the information to be entered or displayed.

- File layouts that define the data base and indicate whether the data is alphabetic or numeric and the size of each data element.

- A report requirement section describing all reports to be generated, including data elements in the report and any totals that are required.

- A section on hardware requirements such as the amount of disk storage, main memory and terminals needed to input and store data for each application. This section also lists the number and speed of the printers needed.

- A summary based on all the specifications listed above that lists the programs required and produces a production schedule.

User commentary involves reviewing the software firm's interpretation of the operation and analyzing the specifications. Will screen formats be compatible with the capabilities and requirements of the system's users? Will the file structure allow access to all data necessary to conduct business? What about future requirements?

These factors should be discussed by the vendor and potential customer in order to draft a final set of specifications. That leads to the final step.

While it is common for a software house to spend a week or two on-site and not be seen again until the completed package is delivered, this is not a good practice. On-site development and implementation allow vendor representatives to talk with the user's staff. When inevitable problems arise, the foundation for amiable discussion is already in place.

Since a software package is usually implemented in several phases, an on-site technical staff allows each part of a package to be tested by the people who will use it as soon as it is completed.

Commissioning a design study, reading and commenting on it and allowing the software house to work on-site are an effective methodology that should result in an application package that performs to user specifications.

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SPECIAL REPORT

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At Canadian General Electric

Manufacturing Package Gives Trio of Benefits

GUELPH, Ont. — Software should dictate the selection of hardware rather than vice versa, according to Jim Gray, material manager at Canadian General Electric (CGE) here.

CGE's material group recently decided to modernize its operations to integrate all master scheduling, purchasing, inventory control, production control, traffic, customs, stores, receiving and operational planning within one system.

The firm, which manufactures large power transformers for utilities and employs more than 800 people, investigated many software packages and eventually selected the MS-11 Manufacturing System from NCA Corp. MS-11 was specifically designed for Digital Equipment Corp.'s PDP-11 family of computers.

One reason for choosing MS-11 was its proven customer base. "Proven" to us meant that the software had to be in use for at least a year," Gray said. CGE obtained a list of MS-11 installations and compared their results with its expectations.

Projecting that the modernization effort would pay for itself within a year and a half, CGE expected benefits in three categories. First, it hoped to reduce inventory by reducing queues of material ahead of final assembly. Second, it wanted to improve purchasing procedures with the use of commitment reports, better supplier tracking and negotiation. Finally, the group wanted to reduce clerical staff.

Real-Time Operations

The firm uses the material requirement planning (MRP) capabilities of MS-11 as an inventory rescheduling mechanism, Gray explained. When schedules change for any reason, the changes can be reflected at all levels down to individual purchased parts and raw materials. "Real-time operations are the key point in having confidence regarding the location of material orders and their due dates," he said.

Also contributing to inventory control are the commitment reports generated by MS-11. These reports provide a detailed and aggregate tally of all items promised to be bought from vendors in current and all future periods and are analyzed by Gray and his supervisors on a regular basis.

"When the aggregate for a current month is running higher than our estimate of what the aggregate should be, we can look at all the items and determine which jobs they are scheduled for," Gray explained. "From there, we decide which purchases should be delayed."

CGE uses the MRP reports to put pressure on suppliers to improve their material shipments. Whenever supplier sales and marketing people call on CGE buyers, they are taken to a terminal that prints out the open order status for that supplier.

Suppliers don't get additional orders until their open-order status "starts to get cleaned up," Gray noted.

MRP and open-order reports are also used to negotiate with suppliers for better prices. "It's a great starting

point at the bargaining table," he pointed out.

The firm is also developing a series of seminars on the MRP system for its suppliers. "If we can give them the whole picture of what is on order, say six months out, they can plan their production accordingly," Gray pointed out. "At the same time, we work with them to outline the close-in, this-month priorities. They can adjust their current production to our needs without touching their total dollar outlay or their total volume load."

"That's the whole essence of MRP,"

he continued. "You make people work on what is needed at any given moment, as opposed to what was originally ordered."

Paperwork Phased Out

The reduction of clerical staff, related files and paperwork was accomplished through attrition. Inventory control, purchasing, receiving, stores and a large part of operational planning are now handled in real-time mode on one of 17 materials-dedicated terminals.

"We haven't typed a single purchase order since last July," Gray noted.

Opting for gradual growth, CGE first adopted the MS-11 inventory control, purchasing and receiving segments. It is now bringing up the operational planning capability.

CGE has followed an innovative implementation strategy, according to Gray. As a section is added, terminals are brought in and left for a few weeks until department personnel become curious about them. Then an experienced secretary is sent over to demonstrate the terminal. After that, the local supervisor is trained, and he becomes

(Continued on SR/28)

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SPECIAL REPORT

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Handles Fivefold Jump in Volume Accounts Payable Package Beats 150 Rivals

ARLINGTON HEIGHTS, Ill. — Faced with a five fold increase in monthly checks after a major acquisition, McGraw-Edison selected McCormack & Dodge Corp.'s (M&D) A/P Plus package over some 150 competitive products to handle the volume.

In addition to performing research on more than 150 software vendor's packages, the firm's representatives conducted lengthy interviews with five finalists. A/P Plus satisfied more of McGraw-Edison's criteria than its competitors with features that included "a good report writer, the ability to handle one-time vendors, more user installations and better training," according to a spokesman.

"Ultimately, we looked at the vendor's documentation," Lyle Murphy, director of the shared management informa-

tion systems (MIS) group, noted. "Computer time is cheap, but people time is very expensive and documentation can have a great impact in terms of software implementation and maintenance. M&D demonstrated they could provide us with good documentation."

McGraw-Edison manufactures and supplies electrical and mechanical products and related services designed for a wide range of industrial applications. The company is organized into six business groups and a total of 15 divisions plus its corporate offices in Elgin, Ill., and employs approximately 38,000 people in 178 manufacturing facilities around the world, a spokesman said. With the acquisition of Studebaker-Worthington, Inc. in October 1979, the firm's combined annual reve-

nue base exceeds \$2 billion, he said.

McGraw-Edison formed a corporate MIS program in 1978 to assist in solving systems problems and facilitate cost-effective operations, he explained.

Software Needs

At the program's inception, the company identified a need to share software systems wherever possible. The primary purpose was to reduce the cost of multiple items including the software itself and corporate manpower requirements both within and outside of DP environments, he said.

Given the number of outside vendors for the lighting division and the corporate offices that were paid through a manually-operated accounts payable system and the pending acquisition of Studebaker-Worthington, the company perceived a clear need to automate the accounts payable function, he noted.

The lighting division paid out an average of 1,600 monthly checks and the corporate accounting office expected the number of monthly checks to increase from 275 to 1,500, he said.

It was projected that automating the accounts payable system would provide im-

proved and more accurate information as well as a faster reporting mechanism than had been possible under the previous manual system. Additional reports were required to calculate expenses and determine inventory levels and pricing trends more quickly, and to interface with the divisions' other automated and manual systems, he pointed out.

Since multiple divisions would use the accounts payable system, representatives from the corporate office and two divisions participated in the process that culminated in the selection of the M&D package.

In addition to allowing McGraw-Edison's corporate office to handle a major acquisition and five-fold increase in monthly checks, the A/P Plus software also provides timely, needed information to allow better planning at the division and corporate levels despite a skittish economy and rising prices, a spokesman said.

The package was purchased in October, 1979 and was installed in approximately two weeks. After bringing up the corporate office in November, the MIS group brought the company's lighting division on the system and began processing its 1,600 check

monthly workload, according to Frank Contreras, senior financial analyst.

Batch Mode

The A/P Plus package runs in batch mode on a 12M-byte IBM 3033 mainframe running under an MVS operating system. The computer system is located in the company's corporate data center with each division using remote job entry (RJE) terminals for data entry and management reporting, he said.

Murphy expected a total of eight divisions using the package within the next two to three years. The company also has some 10 IBM DOS sites, some of which will use different copies of the A/P Plus software running at the corporate data center.

For the firm's corporate group, installing the shared A/P Plus system meant not having to increase its accounting department staff despite the increased administrative overhead resulting from the Studebaker-Worthington acquisition.

Another reporting feature allows each using division to track and reconcile employee travel and expenses automatically, thereby reducing the number of people that must check employee expense reports and minimizing errors.

The accounts payable system "represents the business we do and how we do it. It's a reflection to the outside world of our internal business operations," Contreras said.



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Trio of Benefits Realized

(Continued from SR/27)
responsible for training the entire section.

While CGE has made several minor adjustments to the software, most were necessitated by Canadian business practices and the need to operate in a multinational environment. The company needed conversion factors built in to compensate for different currencies and metric/standard measurement.

Addresses also had to be developed for intracountry exchange. NCA provided these and, in fact, incorporated some of them into its packages.

CGE now uses only about half of the available MS-11 reports, but Gray expects to use more of the standard reports and to add some custom reports as modernization progresses.

The modernization process has had a decided effect on the entire operation of the plant, according to Gray. Many of the older internal parameters are being reevaluated and standard lead times and inventory closings are now in question.

"The rules were written in a

time when it took a week to close out the month. Now you can do it in hours instead of days," Gray noted.

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SPECIAL REPORT

Page 29

Software Smooths Utility's Shareholder Activity

MINNEAPOLIS — Annual savings of \$6,000 to \$8,000 on transfer fees alone resulted from the Northern States Power Co.'s (NSP) decision to administer shareholding activity in-house with the help of Informatics, Inc.'s Corporate Shareholder System (CSS) package.

The electrical utility company has approximately 100,000 shareholders with common stock and three different classes of preferred stocks, according to a spokesman.

Most corporations turn the exchange of share ownership over to financial institutions that act as transfer agents, according to an NSP spokesman. The transfer function includes recording shares bought and sold (transfer of ownership), processing the transfer of certificates to new owners and complying with other legal requirements.

This activity allows the company to know how many stockholders it has, who and where they are and how many shares they own, so it can periodically send financial information and dividends to them and report various transactions for tax purposes, the spokesman said.

NSP used three transfer agents until it licensed CSS in 1977, he said.

Better Service

"With a computerized system, you can offer the shareholder better service," Fred E. Eiselein, administrator of shareholder services, noted. "We used the transfer feature to realize a savings of \$6,000 to \$8,000 a year on the transfer fees." The system also provides good response to shareholder inquiries via two dedicated on-line terminals, he said.

In addition to the two IBM terminals reserved for shareholder relations' inquiries, two others are used for accounting entries, transfers, debits, credits, file maintenance, address changes, Social Security number changes and dividend reinvestment entries, NSP said.

New York Stock Exchange (NYSE) rules require that any company listed on the exchange have a registrar in New York, Eiselein explained. A transfer agent's function is to eliminate the possibility of mistakes when a stock certificate or proof of ownership is transferred from one person to another. The firm also had a transfer agent in Chicago since it is the financial hub of the Midwest and many NSP stockholders are located in or near Chicago, he added.

Whenever there is a problem tracking back transfers, it usually involved recordkeeping in one of these two cities, according to Eiselein. Most of the activity was through New York because even local brokerage houses send stocks there for transfer. "We thought it would be a lot cleaner if we did all the recordkeeping here in Minneapolis," Eiselein said.

NYSE rules allow a company to become its own sole transfer agent under Rule 496 which states that the company must have a bank depository or "drop agent" in New York City where it can leave and pick up certificates. The rule also requires a company to process certificates within 48 hours after they are submitted by the broker-

age house. A number of banks in Minneapolis provide a "drop window" for companies that want to act as their own transfer agents, Eiselein said.

Brokerage firms in New York carry certificates to the drop agent, which examines the documents and sends them by courier to NSP. "We currently use an air freight service since the certificates must be here early in the morning," he said. This allows the internal transfer agent to review them so data entry clerks can enter them on the terminals.

Assuming we're still on schedule, the certificates are printed on a remote terminal in shareholder services at ap-

proximately 1:00 p.m.

The new certificates are sent to registrars at one of two Minneapolis banks for signature, he continued. While the courier waits, the registrar finishes recording the certificates and the package is sent back to New York on the same afternoon. "We are able to meet the 48-hour requirement following this procedure," he claimed.

In addition to transfer activity, Northern States Power also utilizes the CSS Dividend Reinvestment-Full Accounting Employee Stock Option Purchases (Esop/Trasop) module. This allows employees to reinvest dividends or make additional cash purchases of

stock and make it possible for NSP to do the recordkeeping on such transactions, he said. About 15% of the shareholders representing 7% of our shares participate in the dividend reinvestment plan, according to Eiselein.

"We started dividend reinvestment with an open market plan about eight years ago, purchasing shares on the open market with dividends of those people participating [in the plan]," he recalled.

In 1976, NSP went to an original issue plan where the company issued shares instead of buying them on the open market and then brought transfer activities inside NSP.

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SPECIAL REPORT

In-House Effort Worth It?

Benefits, Risks Examined in Package Selection

PENNSAUKEN, N.J. — With more than 30,000 software packages commercially available, based on an estimate by Raymond Wenig of International Management Services, Inc., why spend the money and time to develop in-house applications?

Wenig investigated this and other application software acquisition questions in a report entitled "Searching for Software" from Auerbach Publishers, Inc. here.

The prospects for locating appropriate application packages are limited by two major factors, according to Wenig. One is that software simply does not exist for all applications and the second is that not every package runs on every hardware configuration. A logical rule of thumb is that the more common the application area, the more likely that usable software will be available.

However, since a large number of packages are written for such general applications as payroll/personnel, inventory control and accounts receivable, it is more difficult to identify and locate suitable packages for a particular environment, the report continued.

Wenig listed hardware vendors, software developers, turnkey companies, end users, computer hobbyists, government agencies, trade associations,

universities and cooperative libraries as possible sources of software. While there is no common directory offered by these sources, various catalogs and listings are available for the prospective purchaser (see Figure 1). These sources do not list all available software since many firms with reusable software do not perceive this area as a main line of business, Wenig cautioned. If contacted, however, these companies often consider selling systems to appropriate buyers.

Risk Factors

While time and cost savings together with access to a proven system make application packages attractive to many DP organizations, there are also multiple risk factors to be considered, the report noted. These include search and time costs, the impossibility of modifying functional requirements, program modification costs, unique construction details, poor documentation, lack of maintainability, hardware configuration variances, minimal or nonexistent vendor support, inefficient throughput, growth limits and unknown or latent bugs in the code.

Since software packages seldom match user requirements exactly, the cost of modifying the programs is one factor that should be examined very

carefully, Wenig stressed. The required modifications are sometimes more risky and difficult to design and build than a new system. In addition, the package limitations and idiosyn-

Since software packages seldom match user requirements exactly, the cost of modifying the programs is one factor that should be examined very carefully. The required modifications are sometimes more risky and difficult to design and build than a new system.

cracies are often neither obvious nor well-documented, the report noted. In fact, the "cost of modification often exceeds the [original] cost of acquiring the software."

Therefore, Wenig maintained, the decision to purchase a software package should be based on the cost of acquisition plus the cost of the required modification adjusted by the risk of its successful implementation. And, although the acquisition cost can be estimated carefully, the modification cost should include "sizable contingency value to compensate for unknown and unpredictable difficulties," he said.

End users must be involved in defining the required modifications in reference to the package under consideration, the report continued. The evaluation team and/or the product vendor would develop a list of changes needed

to meet the requirements statement.

The next step involves selecting the party who will make the changes. Logical choices for this assignment would be the software creator, internal programmers, a third-party software vendor or other users who have made similar modifications, the report stated.

Other Methods

Two other methods were suggested to circumvent the modification problem. One is to use the package "as is" by developing interface modules to perform the desired results. The second is to extract the major elements from the software package and build routines to perform the required functions. Regardless of which method is chosen, Wenig repeated that "it is imperative to weigh the risk of making the modification."

In addition to program modification, some adjustment in the system development life cycle will result from acquiring an application package, according to the report (see Figure 2). The design phase is usually most affected since it must include the software search, evaluation, acquisition and modification. However, even if these steps fail to produce an acceptable package on a permanent basis, Wenig suggested that a package might be acquired as a temporary measure while a tailored system is developed by the in-house staff.

Additional reports on software acquisition are available from Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Type of Listing Source	Example/Contact	Cost	Type of Software	Remarks
Vendor Software Lists	Most major equipment makers (IBM, Burroughs, NCR, etc.)	Free	Special vendor packages Field-developed systems	Lists only programs for vendor systems Irregularly updated
Vendor Referral Directories	Several mini-computer vendors (DEC, DG, Data-point, etc.)	Free	Programs produced by contracted OEM vendors Usually applications-oriented	No quality guidelines Irregularly updated
User Group Libraries	Most computer vendors (IBM-SHARE, DECUS, etc.)	\$5-500 membership fee	Variety Mostly subroutines and utilities Few applications	Standardized abstracts Irregularly updated
Published Directories	ICP Directories AUERBACH Applications Software Reports Minicomputer Software Quarterly RSI Catalog of Minicomputer Software	\$65-350 subscription (usually 1 year)	Mostly applications	Regularly updated Many cross-reference indexes
Trade Associations	National Association of State Information Systems Office Products Auto Parts	Varies	Trade applications	Not updated Variable content and quality
Government-Supported Agencies	COSMIC — University of Georgia Federal Software Exchange	\$0-75	Wide range of government-sponsored software products. Technical and commercial applications	Detailed listings Irregularly updated
Technical Press Advertising	Computerworld Datamation	\$0-25/year subscription	Proprietary systems from software vendors	Variable content No indexes
Search Publications	Computer Hotline User Groups	\$0-50/year membership	Requests for specific software sources Listings of new offerings	Regular publication No indexes Repeated requests

Figure 1. Software Location Chart

Phase	Activity	Time Range	Pitfalls
Define Requirements	Specify required and desirable features	2 weeks to several months	Incomplete specifications Not separating requirements from desirable features
Search for Suitable Packages	Match program requirements to available packages	1-4 weeks	Finding no matches Insufficient information
Package Evaluation	Review and evaluate software packages for match to requirements	2-6 weeks	Learning package details
Software Acquisition	Negotiate and contract for acceptable software package	1-4 weeks	Lack of agreement Compromises
Modification Planning and Design	Detail the required modifications	2-8 weeks	Difficulty in defining the required modifications Inadequate documentation
Modification and Testing	Build and test the modifications	Varies	Inadequate test data Modifications that do not work Inefficient modifications
Implementation	Install and cut-over to the modified system	2-6 weeks	Misinterpretation of the requirements Operational flaws
Performance Review	Evaluate the system and plan future modifications and enhancements	4 days to 2 weeks	Inappropriate expectations System or modification flaws

Charts Courtesy of Auerbach Publishers, Inc.

Figure 2. Modified Development Life Cycle for Software Evaluation, Purchase, Modification and Reuse

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Directory-Driven Approach Communications System Spans Alaska

ANCHORAGE, Alaska — More than a half-million square miles is a large area, but Alascom developed a communications network utilizing Cincom Systems, Inc.'s Total Information System (TIS) that brings Alaska's borders closer together.

Alascom took over the Alaska/Communications system from the U.S. Air Force in early 1971 and has been expanding and upgrading the state's long-distance system ever since in order to keep pace with a rapidly expanding population, a spokesman explained.

The organization realized that satellite communications systems

were necessary to meet the commitment to expansion because of Alaska's scattered population, rugged terrain and severe climate, he said.

"Our initial move to the data base environment enabled us to begin integrating our data and thereby provide the information we needed to initiate many of our progressive communications plans," John Ayers, director of management information systems (MIS), said.

Initial Conversion

Cincom's Series 80 Total data base management system (DBMS) and Environ/1 telepro-

cessing (TP) monitor supported Alascom's initial conversion to data base in 1977. Although this step improved overall productivity and response to the customer environment, the organization was looking for an additional tool within two years.

By 1979, when Alascom became a subsidiary of Pacific Power & Light, managers were already asking for software that would help them to manage their areas more effectively.

Coinciding with these discussions, Cincom announced TIS, and Alascom management felt that a move to the TIS directory-driven approach was in keeping

with future plans. "It provided the ability for the manager, himself, to work with the system through query to extract the required information," Ayers said.

The product was installed in March 1980, and Alascom's current TIS system includes directory, directory maintenance on-line, DBMS, communications monitor, comprehensive retrieval, on-line and batch query, utilities, Cobol XT, task-level recovery, advanced mapping and standard access method components.

Logical Link

Alascom's information data communications system (Aids) will be based on the TIS software with the objective of providing easy access to data on demand while keeping in mind "obvious security restrictions," according to a spokesman.

"Our user-oriented system is being designed to create a logical link between [the data bases] where the information lies and the place where it needs to be

(Continued on Page 68)

Four Features Added

'Panvalet/On-Line' Backs IBM 3278

OAK BROOK, Ill. — Release 3.0 of Panvalet/On-Line adds four features along with support for the IBM 3278 terminal.

The dual-screen facility allows a user to create two logical screens from one logical screen, the vendor claimed. In addition, the product features the ability to have two independent Panvalet/On-Line sessions active at one time on the same physical screen.

That allows the user to view two members or two portions of the same member together and the editing of either the top or bottom screen portion (the cursor position determines the logical screen in control).

The full-screen mode facility enables a user to perform multiple edit functions with one terminal transmission, a spokesman said. For example, a user can add, delete and change lines in the terminal data area and issue an unrelated command in the command line and only require one terminal transmission for all those activities to be processed.

The PF key support is a mechanism allowing high user Panvalet/On-Line commands to be assigned to a single key function. All functions are defined as command sequences and set at installation time. A default set of 12 PF key definitions is supplied but a user may change them, cus-

tomizing them to his environment, the spokesman said.

Support is now provided for the 3278 models 2, 3, 4 and 5. Panvalet/On-Line will identify the terminal model it is communicating with and set the

screen size dynamically, the spokesman said.

The system costs between \$5,000 and \$7,000, depending on configuration, the vendor said from 709 Enterprise Drive, Oak Brook, Ill. 60521.

'Foundation' Built for Non-DP Execs

PRINCETON, N.J. — A software package that reportedly allows business executives with no DP experience to retrieve, manipulate and display data in an interactive environment has been developed by Applied Data Research, Inc.

Foundation is said to provide the facilities needed to describe and access data files, perform input, validation and manipulation of data values, generation of reports and creation of new data files.

Foundation, which also features a file editor, is not a traditional data base management system (DBMS), according to a company spokesman. While a DBMS is primarily designed to be used with structured data files, Foundation reportedly can retrieve information from various sources and formats as though they were one virtual data base, he explained.

The system features concurrent access of up to 10 data files in a variety of modes, flexible report generation, data item dictionary, data validation for entry and update and ability to create new files for internal or external use.

Foundation may now be installed on Digital Equipment

Corp.'s Decsystem-10, Decsystem-20 and VAX processors and on IBM's 370, 30 series and 4300 under CMS and TSO.

A first-site license fee costs \$30,000 from the firm's Application Products Information Center, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

'Datacom/DB' Updated

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced a version of Datacom/DB that allows operation of the data base in a virtual machine environment under IBM's conversational monitor system (VM/CMS).

Release 7.2 also features multiple data set support to provide for logical areas that span multiple physical data sets, designed to eliminate "the traditional operating system limitation of 16 extents," a spokesman said.

Dynamic allocation of logical areas reportedly will allow areas to be allocated when needed, rather than being available all the time. In addition, a new user exit available during recovery will allow backout of non-data-base records.

A permanent license for Datacom/DB under VM/CMS costs \$57,000. Monthly, three- and five-year leases are also available from the firm at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

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System Spans Half-Million Square Miles

(Continued from Page 67)
processed and delivered with a minimal amount of traditional MIS interface," John Toole, manager of systems and programming, explained. "It is also the logical link to administer communications between key locations and the remaining Alascom manned locations."

The Aids system is expected to tie each of the Alascom locations together as a network; to manage the flow of administrative data; to provide access to all the data bases stored at various time-share houses used to supplement the company's own processing system; and to integrate all the user data bases with the necessary editing, updating and reports performed by the users along with controls/security to

protect confidential or important data files.

The company currently processes its information DP function with an IBM 3031 and additional help from outside time-sharing services. It plans to consolidate all outlying data bases to a centralized system under TIS by mid-year, a spokesman said. There are 73 3270-type terminals comprising the TP environment with 43 terminals allocated to user environments, and plans call for a total 110 terminals in 1981.

Currently available under TIS are the system service order (SSO) system and an order status system which support approximately 20% of the corporate

revenue, he continued. The SSO system provides a data base with on-line updating which captures an order at the time marketing accepts it from the customer and controls the order through the whole process including the recurring billing cycle.

The order status system provides a data base for status of all types of service orders in progress. Authorized departments input the status of a given order and access this information by various keys such as order number, order type or status data field. The system also provides users with the capability of adding English-language remarks to identify status input in more detail, the spokesman said.

The firm had acknowledged a five- to 10-year commitment to the TIS concept, according to Ayers. However, it is possible that Alascom may consolidate its data center with the communications arm of Pacific Power & Light, Toole noted. This would probably mean a move to Vancouver, Wash. and he wasn't sure which of several DBMS would be used there.

In the meantime, 13 additional systems are expected to go up by mid-1981, and these projects include:

- **Payroll/Personnel data base:** Provides payroll and employee relations with access to more than 300 data elements related to an individual employee and provides other departments access to nonconfidential data and to edit/balance individual time reports.

- **Separations data base:** To break out distribution of revenue by area received.

- **CTI:** A system to track investigation of fraud calls and to correct and/or recycle rejected calls for subsequent rebilling.

- **Financial data base:** Includes general ledger, accounts payable and the Alascom chart of accounts.

- **Engineering data base:** A project, financial and control status system which will provide on-line updating maintenance and reporting capability of all engineering projects.

- **Customer data base:** An expansion of the existing customer master file will be linked to the order status and SSO systems and will continue all data relative to customer billing, addresses and credit ratings.

- **CPEX data base:** Will include all information regarding the Alascom communications network and will link to the SSO, order status and financial data bases.

- **Toll paper ticket system:** A system for collecting toll-call information to conform to AT&T standards.

"Our development and implementation schedule is very intense over the next year," John Toole acknowledged. "But under full operation, we estimate an 80% reduction in programmer re-writing."

Directory Concept

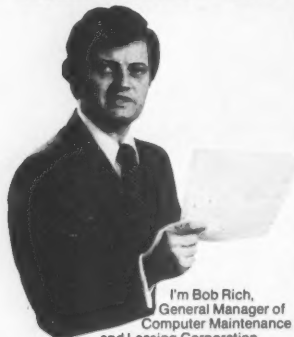
A significant advantage Alascom found in its move to TIS is the directory-driven concept. This technology represents the major control point that enables DP to adapt to the changing needs of the user, the company said. It keeps track of all data items, their characteristics, locations, usage, users and their roles in satisfying information needs.

"By defining data at the element level, we have been able to gain a higher level of control, while expanding the accessible data significantly within just the last three months," Jim Capra, information systems coordinator, said.

The logical views created in the directory map the entire system in the directory reports. This allows the programmer to navigate the system efficiently and reduce his programming time, he maintained.

"With TIS, we have also been able to increase the overall security of the system," Capra noted. The logical view provides ease of access to both programmers and endusers and maintains the proper security features required to run the system."

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Inventory Eased For HP 1000s

SEA GIRT, N.J. — Polaris Systems, Inc. has announced IMS-1000, an inventory and manufacturing system which reportedly gives a complete order entry, purchasing, inventory and production control system for Hewlett-Packard Co. HP 1000 users.

IMS-1000 features on-line inquiry of inventory status, parts availability, order status, where-used analysis and bill of materials explosion, a company spokesman said.

Minimum equipment required is an HP 1000 with RT II, III or IV, the Image data base management system and any of the HP-264x series CRT terminals.

Prices range from \$7,500 to \$30,000 based on modules selected, from Polaris Systems, Inc., 2100 Old Mill Plaza, Sea Girt, N.J. 08750.

'PMS' Updated For Prime Users

SCRANTON, Pa. — Computer Techniques, Inc. has enhanced its Proven Management Solutions (PMS) package for Prime Computer, Inc. hardware configured to run the Primos or Midas operating systems.

Enhancements include an active data dictionary that can be accessed from a relational-type data base, data file support, easier access from processors and extended systems administration and general features, the vendor said.

PMS costs \$9,600, including the enhancements, Computer Techniques said from 1015 N. Main Ave., Scranton, Pa. 18504.

TI 990 Gains Applications Aid

E. THETFORD, Vt. — Synergistic Systems has announced Adapt-990, an interactive program that simplifies the design, programming and documentation of Basic application programs for Texas Instruments, Inc. 990 CPUs.

Features include automatic documentation of file structures, multiple indexing, indexes across files, data storage management and input data validation, the vendor said.

The package costs \$2,495, the vendor said from Cobble Hill Road, E. Thetford, Vt. 05043.

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Syntax Converter Translates Univac Cobol to IBM Cobol

BUFFALO, N.Y. — Dataware, Inc. is offering a syntax conversion system to Sperry Univac 1100 sites that wish to convert their Cobol programs to IBM Cobol. The five possible Cobol transitions include U1100/FD to IBM OS, U1100/FD to IBM DOS/VSE, U1100/Ascii to IBM OS, U1100/Ascii to IBM DOS and U1100/Ascii to IBM DOS/VSE.

The differences addressed by each transition include collating sequence, word size, bit usage and print file conventions, according to Dataware. Other considerations such as communications, data base, ECL/JCL and system utilities differences must be manually resolved and will vary according to the different operating environments, a spokesman added.

The output of the package aligns the original Univac with the IBM Cobol

code whenever syntax changes have occurred.

The conversion worksheet also provides diagnostics to the right side of the listing to assist the programmer in his post-review effort. The diagnostics issued flag the problem line of code with self-explanatory messages varying from warning-type situations to those reflecting a feature no longer available when going to the target environment.

The software (base program and specific syntax table) can be licensed for an annual fee of \$4,800, which includes documentation and maintenance. Dataware is located at 2565 Elmwood Ave., Buffalo, N.Y. 14217.

Report Generator Self-Prompts

WELLESLEY, Mass. — Warner-Eddison Associates, Inc. has announced Inmagic, a report-generating package that reportedly provides access to variable-length text records and operates with self-prompting commands.

The data management system performs subject searches using Boolean criteria by numerical, chronological and full-term or key-word indexing at various levels of detail. Printing output on cards, labels and other formats, Inmagic provides on-line record maintenance.

Inmagic runs on Digital Equipment Corp. PDP-11 computers under RT-11, RSTS/E, RSX-11M operating systems or VAX/VMS, as well as on the Hewlett-Packard Co. HP 1000. It is written in Fortran IV with a 100K-byte program size and 56K-byte main memory requirement.

Warner-Eddison said applications include business and technical document collections, engineering drawings and vendor catalogs.

Inmagic is priced starting at \$6,875 from the vendor at 186 Alewife Brook Parkway, Cambridge, Mass. 02138.

'Flipper' Backs HP's MTS/3000

COUNTRYSIDE, Ill. — Systech, Inc.'s CRT forms storage program, Flipper, now supports users of Hewlett-Packard Co.'s MTS/3000 system.

Previously supporting only asynchronous communications, Flipper is said to automatically store DEL or V/3000 form displays in the terminal's memory, providing immediate recall and display.

In addition to supporting the MTS/3000, the release also features an improved forms compression technique, whereby it optionally removes the oldest, least used form when memory fills and dynamically reallocates memory to handle exceptionally large forms.

Flipper costs \$3,000 from 6150 Joliet Road, Countryside, Ill. 60525.

CICS Performance Monitor Functions Under DOS/VS

MARINA DEL REY, Calif. — Candle Corp. has announced a CICS performance monitor that functions in an IBM DOS/VS environment.

The Omegamon/CICS package is a software monitor that operates on CICS/VS Release 1.4.1 and above. Features include monitoring of CICS lockouts, response time problems and system utilization, Candle said.

The package displays CICS performance information on a CRT screen.

It also offers exception analysis to diagnose problems with storage, Vsam and enqueues. Degradation

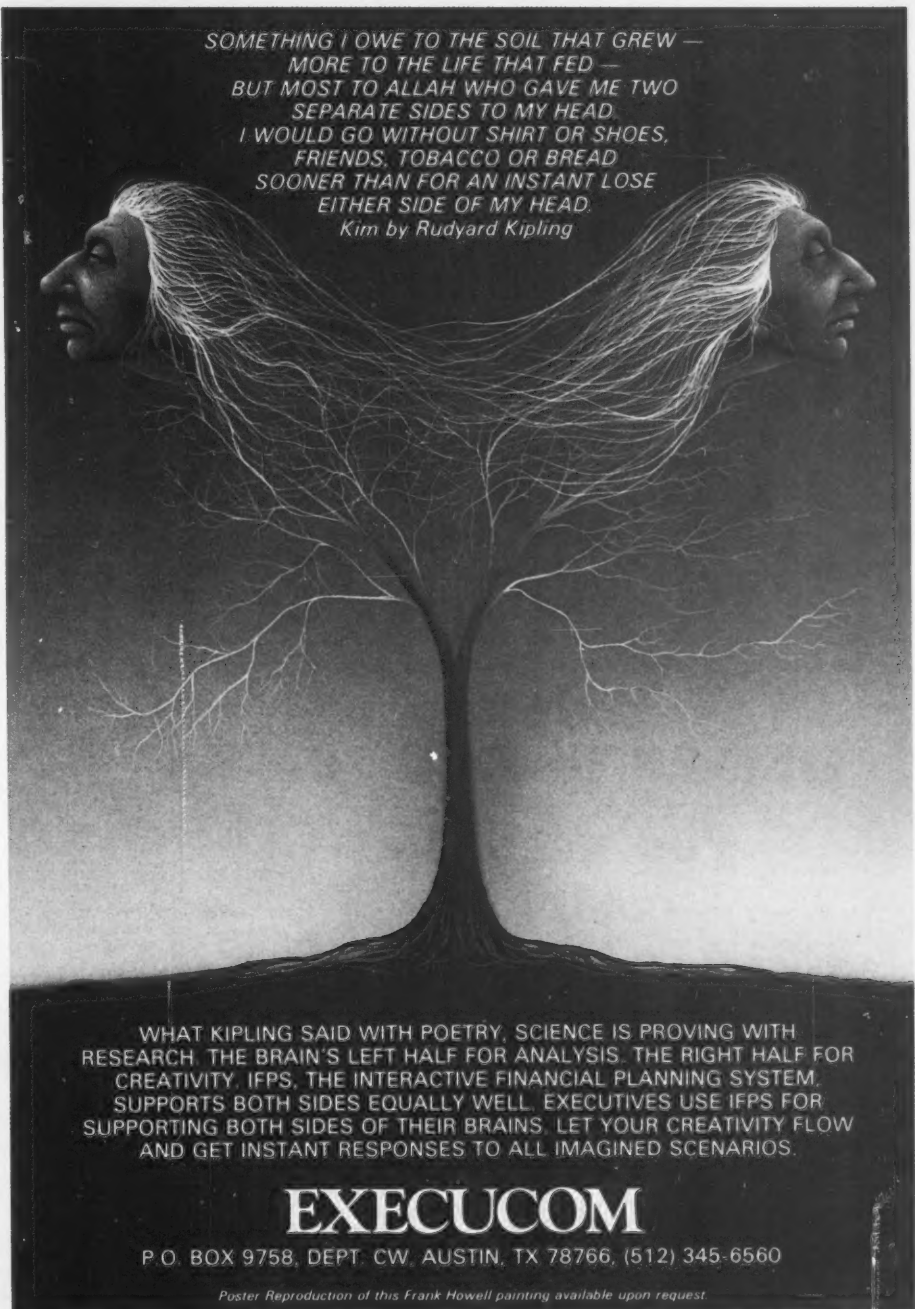
analysis tells the user why specific transactions are being degraded, the vendor said.

Omegamon/CICS can be installed in about 20 minutes without hooks or authorized libraries, a Candle spokesman claimed. The monitor can be used as a CICS transaction or on a dedicated 3270 terminal.

The monitor is available to CICS DOS/VS users for an introductory price of \$4,900; after the introductory offer, the price will be \$7,500.

A 30-day demonstration of the product costs \$100, the vendor said from Suite 624, 4676 Admiralty Way, Marina Del Rey, Calif. 90291.

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Poster reproduction of this Frank Howell painting available upon request.

MSA Group Formed

CLIFTON, N.J. — Non-IBM users of Management Science America (MSA) software have formed a users group. The first meeting was attended by five companies, a number that has subsequently grown to 10.

The purpose of the group is twofold: to make contact with other non-IBM MSA users and to exchange ideas and share experiences.

Anyone interested in more information should contact Sandy Montroy or Mary Ciulla at General Instrument Corp., 225 Allwood Road, Clifton, N.J. 07012.

'File Zero' Protocol Out

NASHUA, N.H. — A software protocol that reportedly permits data base entry, storage, manipulation and retrieval is available from the Functional Automation Division of Gould, Inc.

Designated File Zero, the protocol resides in all F-64 Cyblok computing and I/O processing modules and reportedly allows preparation and use of software programs

regardless of the type, mix or memory storage media.

With an identical message interface for all media, languages and users, it is said to simplify access to an expansion of the data base stored in a Cyblok network.

There is no charge for the protocol, which is part of the Cyblok system, the vendor said from 3 Graham Drive, Nashua, N.H. 03060.

Through Integrated Information System Wang Unveils WP for 2200 Series

LOWELL, Mass. — Wang Laboratories, Inc. has introduced word processing (WP) for its 2200 series of small business computers.

The WP functions, supported through a new Integrated Information System workstation, include document editing, creation, print, storage and filing capabilities, a spokesman said.

In addition, the 2200 series Integrated Information Systems have all 2200 telecommunications facilities and capabilities, including IBM 3270 emulation.

Price Quotes

The 2200 Word Processing software package is available for \$2,000. The 2236DW workstation costs \$3,500, and

upgrades of present 2235DE terminals are available for \$1,000.

Product availability is sched-

uled for March.

Wang is headquartered at One Industrial Ave., Lowell, Mass. 01851.

'IC-10' System Updated; Aimed at Semi Industry

SANTA CLARA, Calif. — Software Management Corp. has announced Release 3.0 of its IC-10 Integrated Circuit Manufacturing Information System featuring data base and hardware-independence and integration with a number of companion products.

Created for the semiconductor industry, the on-line management information system is said to provide control and visibility of the entire semiconductor manufacturing and production environment.

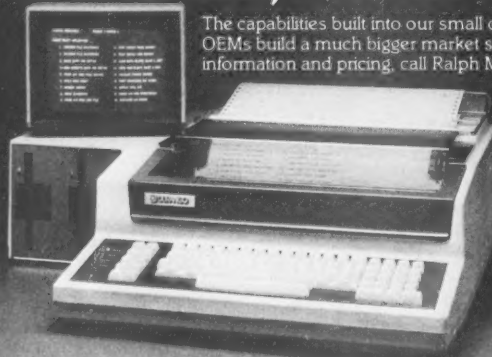
Release 3.0 is fully integrated with the firm's CA-10 Integrated Circuit Cost Account-

ing and Inventory Evaluation System and a number of planned future companion products, according to a spokesman.

A Hewlett-Packard Co. HP 3000-based version running under the Image data base costs \$95,000 for the first installation. A Digital Equipment Corp. VAX-11/780 version using DEC's Isam file system also costs \$95,000, and an IBM version under CICS/DL-1 costs \$99,500.

Software Management is located at Building 58, 3350 Scott Blvd., Santa Clara, Calif. 94025.

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Xerox's 'XICS' Eliminates Composition Operations

EL SEGUNDO, Calif. — A software package designed to eliminate conventional composition operations in publishing has been unveiled by the Printing Systems Division of Xerox Corp.

XICS will be used in conjunction with the Xerox 9700 electronic printing systems and will also run with other CPUs, the vendor claimed. The package accepts text from any terminal or word processor and formats it into complete pages for printing on the

9700.

The formatting includes all composition and page makeup, a spokesman said.

XICS consists of programs like edit and update, publication masterfile management and composition and pagination.

The one-time license fee for the product is \$30,000, plus \$250/month maintenance charge and a \$2,000 installation fee, the vendor said from 880 Apollo St., El Segundo, Calif. 90245.

Commodore Offers Free Disaster-Relief Program

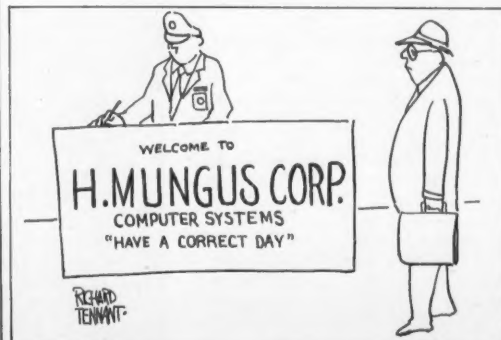
NORRISTOWN, Pa. — Commodore Business Machines, Inc. will release free of charge to its 500 dealers a disaster-relief software program first developed at the site of the MGM Grand Hotel fire during Comdex '80 in Las Vegas last fall [CW, Dec. 1].

The program keeps track of the names, addresses, hotel

room numbers and relocation sites of guests in the event of disaster.

Should a comparable emergency occur again, Commodore dealers will be able to aid local disaster-relief organizations, a spokesman said.

Commodore is located at 950 Rittenhouse Road, Norristown, Pa. 19403.



Four Programs for IBM 5280 Target First-Time Users

OMAHA, Neb. — MHA Software Services, Inc. has announced four packages — Accounts Receivable, Accounts Payable, General Ledger and Payroll — for the IBM 5280. Each program uses a full 24-in. by 80-in. interactive screen and is initiated through menus designed for the first-time computer user.

Accounts Receivable features either open item or balance forward accounting, with on-line inquiry available without the need to assign account numbers.

Accounts Payable also generates checks based on date due assigned when the invoice is first entered; hand-written checks may also be entered for listing on the month-end check register, a spokesman noted.

General Ledger

General Ledger shows a balance forward and all activity for the current month. It also includes a user-defined balance sheet and operating statement; Payroll features four hourly pay

types and eight deduction types, while updating tax routines at year-end for an annual fee.

The packages, available immediately, license for \$1,500 each. MHA Software Services is at 7117 Farnam St., Omaha, Neb. 68132.

'EDX Report Writer' Backed on Version 3 Of IBM's EDX

SAN FRANCISCO — The Event Driven Executive (EDX) Report Writer is now supported on Version 3 of IBM's EDX, Raymond G. Lorber, Inc. has announced.

The EDX Report Writer for Series/1 minicomputers can now support the index access method (IAM) supplied by Applied Real-Time Systems, Inc.

The suggested price is \$5,000, with multiple copy discounts available from Raymond G. Lorber, Suite 2840, 333 Market St., San Francisco, Calif. 94105.

From Info III System/34 Gets Job Utility

WOODLAND HILLS, Calif. — Info III has announced the Job Time Utility Program, said to allow IBM System/34 users to control the time when any job is to be run.

The utility can prevent a job from being run during any times inside or out-

side the limits specified, the vendor said.

The price is \$50, including diskette and mailing costs.

Info III is headquartered at 21250 Califa St., No. 107, Woodland Hills, Calif. 91367.

'Datascan' Fits System/34

ATLANTA — Data Management Systems, Inc. is offering Datascan, its data management system, for use on IBM System/34 computers. A similar product, ASK, is available for the NCR Corp. 8000 series.

Datascan can be used with any exist-

ing data bases without changes in current files, data structures or existing DP procedures, the vendor claimed.

The product costs \$6,250 for a one-time license fee, the vendor said from Suite 809, 4360 Georgetown Square, Atlanta, Ga. 30338.

Newsletter Aids System/34 Users

LUDLOW, Mass. — Computer Technologies, Inc. is offering free subscriptions to its newsletter devoted to software techniques for the IBM System/34.

The newsletter announces test tips and techniques, in addition to newly developed packages.

The firm may be reached through P.O. Box 259, Ludlow, Mass. 01056.

'FMS-80' Training Tapes Available

PALO ALTO, Calif. — Systems Plus, Inc. has developed video training tapes for DJR Associates, Inc.'s FMS-80 data base management system.

Available on VHS or Beta Max format, the tapes include a 90-minute reel and one of two hours. The first tape explains the fundamentals of FMS-80 and tells how to generate file defini-

tions, screens, reports or user-defined menus.

The second tape discusses the features of FMS-80's report generator and internal programming language called Extended File Maintenance.

The set costs \$130 plus shipping charges from 3975 E. Bayshore Blvd., Palo Alto, Calif. 94303.

Enhancements Added to 'Cuffs'

NEW YORK — Cuffs Planning & Models, Ltd. has announced Release 5.05 of its Combs-Unangst Financial Forecasting System (Cuffs).

Enhancements to the modeling language include improved data entry, functions, report writing, goal seeking and multilevel consolidation features. Cuffs is also offering a seminar program for financial planners who want to know more about computerized fi-

nancial modeling.

The Cuffs update is available as part of the maintenance agreement for in-house users. It also has been distributed to time-sharing firms offering Cuffs.

The Cuffs package costs \$45,000 for in-house use. More information is available from the vendor at 201 E. 87th St., New York, N.Y. 10028.

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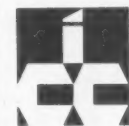
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'Reportwright' Tailors Custom Reports

COSTA MESA, Calif. — California Systems Associates has unveiled Reportwright, a package that reportedly allows creation of specialized reports tailored to user requirements. The package is designed for middle and upper-level managers and other nonprogrammers, a company spokesman said.

Reportwright is designed for use on Digital Equipment

Corp. RT-11, TSX and TSX-Plus equipment and can draw information from a variety of data bases, including Mini-Computer Business Applications, Inc. (MCBA) software packages, the spokesman said. The price of Reportwright is \$500.

California Systems Associates is at Suite 4, 2845 Mesa Drive E., Costa Mesa, Calif. 92626.

DBL Available for RSX-11M

CARMICHAEL, Calif. — The Digital Information Systems Corp.'s DBL language is now available for use under the Digital Equipment Corp. RSX-11M operating system. DBL reportedly makes available to RSX users the library of DEC's Dibilol business application packages available under both CTS-300 and 500.

Included with the DBL compiler and run-time system are a debugging facility, Isam file creation and status utilities

and a utility to load and unload Isam files, a company spokesman reported.

The price of the package is \$4,200 with quantity discounts available.

counts available.

Digital Information Systems Corp. is at 6247 Fair Oaks Blvd., Carmichael, Calif. 95608.

Plessey Packages Handle Cobol, Dibilol on LSI-11/23

IRVINE, Calif. — Plessey Peripheral Systems, Inc. has unveiled two commercial software packages designed to accommodate Cobol and Dibilol on the vendor's Syst-13V or Digital Equipment Corp.'s LSI-11/23 systems.

commodate Cobol and Dibilol on the vendor's Syst-13V or Digital Equipment Corp.'s LSI-11/23 systems.

PCS-100 and PCS-200 also feature TSX-Plus, a multitiered operating system especially suited for business DP. TSX-Plus also provides time-sharing capabilities.

PCS-200 TSX-Plus with Cobol-Plus, supplied on a top-loading cartridge disk, carries a one-time price of \$3,358, the vendor said from 1691 Browning Ave., Irvine, Calif. 92714.

Service Bureau Co. Adds Program

GREENWICH, Conn. — The Service Bureau Co. has added a Purchase Order Matching and Control System to its existing accounts payable service.

The system allows the user to compare invoices automatically with open purchase orders. It can also be used to maintain closer control over receipt of goods and past-due shipments, the vendor said.

The program is a batch-oriented program and is billed on an as-used basis, the vendor said from 500 W. Putnam Ave., Greenwich, Conn. 06830.

Dow Jones News Updates Service

NEW YORK — Dow Jones & Co., Inc. is offering Money Market Services' Weekly Economic Survey data base with the computerized Dow Jones News/Retrieval Service.

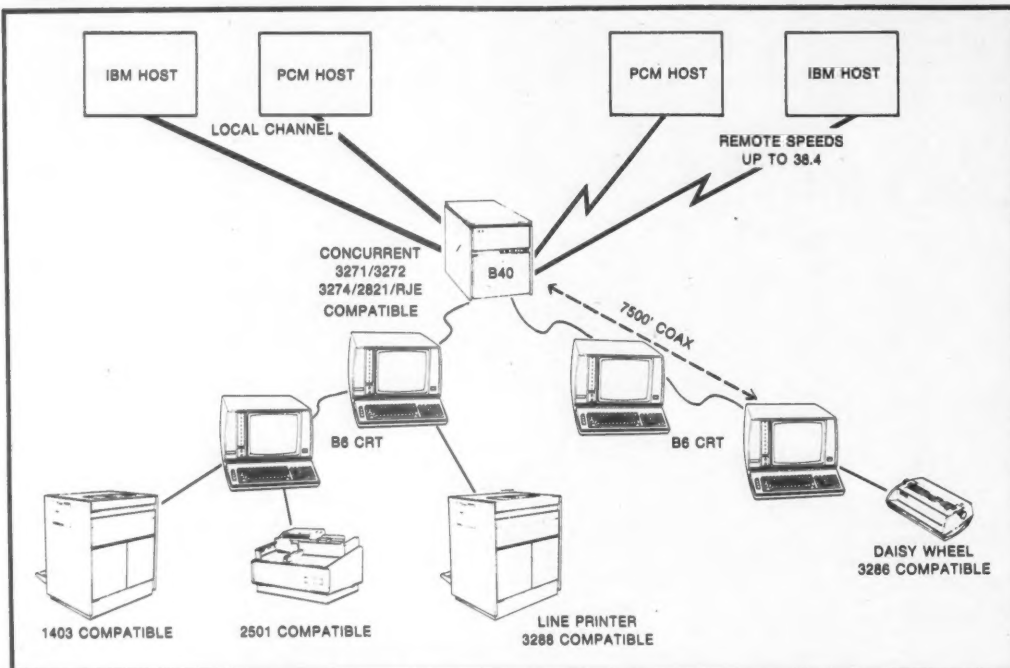
The Retrieval Service will now feature economists' forecasts of changes in indicators such as the weekly money supply, federal funds rate, unemployment rate, consumer price index and gross national product, the company said.

Access to the economic survey is priced at \$40/mo and \$2/min from Dow Jones & Co., Inc., 22 Cortland St., New York, N.Y. 10007.

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System Offers Interactive Testing

ALEXANDRIA, Va. — An interactive test system for data communications protocol diagnostics has been introduced by Atlantic Research Corp.

The Interviewer 4500 is said to offer features designed for packet protocols and IBM's Systems Network Architecture (SNA), as well as detailed analysis of High-Level and Synchronous Data Link Control. Bisynchronous, asynchronous and Ascii, Pars, EBCD, XS-3, Selectric and Ebcidic are standard in the unit.

The diagnostics of the 4500 use a self-teaching simultaneous trigger technique, allowing up-to eight independent triggers to be active at the same time.

The Interview 4500 costs \$14,500. A conversion kit to change an existing Interview 3500 to a 4500 costs \$5,000 from the firm at 5390 Cherokee Ave., Alexandria, Va. 22314.

Remote Controllers SNA-Compatible

NASHVILLE, Tenn. — Northern Telecom, Inc.'s Electronic Office Systems has brought out a family of on-line data display systems compatible with IBM's Systems Network Architecture (SNA).

The family consists of the Model 296C, a small-cluster remote controller comparable to the IBM 3276, and the Model 294C, a large-cluster remote controller comparable to the IBM 3274-1C, according to a Northern Telecom spokesman. The Model 296C reportedly can control up to eight display stations and Sprinter bidirectional printers, the 294C up to 32 display stations and printers.

All peripherals can operate at distances up to 5,000 ft from the controller.

The SNA command functions will enable users to perform system control operations from remote terminals, the spokesman noted. For example, an authorized operator in a remote office can assign or reassign another display or printer and activate or deactivate a controller in the network.

The two terminals come with a choice of three screen capacities: 1,920, 2,560 or 3,440 total characters, using 80-char. lines. Each of these screens includes an extra status line which provides the operator with system information.

The Model 294C can also control Model (Continued on Page 74)

Land Developer Selling Common-Carrier Services

By Brad Schultz
CW Staff

HOUSTON — Just as water adds value to land, so does data communications, and that is why a Texas land developer has entered the specialized common-carrier business in a move that speakers here at the recent Communication Networks (Comnet '81) conference described as part of a trend.

Land developers selling communication services? Times are hard for companies that sell land for construction of office buildings, shopping malls and homes, so the Las Colinas Association of Irving, Texas, is stringing two 54-channel coaxial cables to each residence on half its 12,000-acre development near Dallas.

Bypassing phone company resources and available only to Las Colinas tenants, the facilities are driven by a Hewlett-Packard Co. 1000 minicomputer, Data General Corp. Micronova, Digital Equipment Corp. PDP-8 and several Apple Computer, Inc. Apple II, Radio Shack TRS-80 and Zilog, Inc. MCZ microcomputers.

Services include a range of viewdata-type offerings — home and office access to consumer and commercial data bases — as well as news wire services, security offerings such as links between alarms on tenant premises and the local police and fire departments and a host of entertainment programs.

According to David L. Leininger, Las Colinas vice-president and general manager, these services will be a source of revenue and help draw builders and buyers of property during the present slump in the real estate and construction industries caused by soaring mortgage and loan rates.

Expensive Properties

Other land developers may be planning such an approach to stagflation fighting, he told the conference session, although the Las Colinas master plan specifies development of "very high-end" properties — too expensive for most people to acquire.

The four-trunk Las Colinas Association Communications Systems (LCACS) will eventually be a hierarchical, local distribution network facility, Leininger said. LCACS will interface Ethernet-type local net systems, distributed data bases maintained by Las Colinas, public packet-switched networks and private corporate networks.

Las Colinas does not plan to construct internal networks for corporate tenants, which now include several high-technology firms and branch offices, including a 1,200-employee IBM support center. Instead, LCACS will be the "backbone" of data communications facilities established by these businesses.

To date, Las Colinas has spent about \$35,000 per mile for the basic LCACS plant and another \$20,000 per mile for the trunks that will soon distribute plant services at 400MHz.

Las Colinas decided to lay out its own system rather than obtain a system from Bell because Bell did not offer adequate error rates and line speeds, Leininger noted. Also, the land developer wished to eschew affiliation with the various coaxial cable companies because their reputation and marketing objectives appeared to conflict with the Texas firm's own objectives, he added.

Among issues and problems yet to be re- (Continued on Page 74)

Terminals Linked To 32-Bit Megamini

OCEANPORT, N.J. — The Computer Systems Division of Perkin-Elmer Corp. has introduced a data communications adapter for use on its Megamini line of 32-bit minicomputers.

The Current Loop Communications Multiplexer (CLCM) is said to provide an economical solution to attaching terminals to a Perkin-Elmer computer system. CLCM allows terminals to be located up to 5,000 ft from the computer system.

The product provides eight asynchronous communications lines with a current loop interface. Each individually programmable line interfaces to the multiplexer bus of any Perkin-Elmer 32-bit processor and reportedly provides full duplex operation with the connected terminals.

Sixteen transmission rates from 50- to 19.2K bit/sec are available, with selected groups of up to four transmission rates programmable at one time. The unit can transmit data at 4,800 bit/sec at 5,000 ft, with higher rates available over shorter distances.

The CLCM costs \$2,200 from the Computer Systems Division, Two Crescent Place, Oceanport, N.J. 07757.

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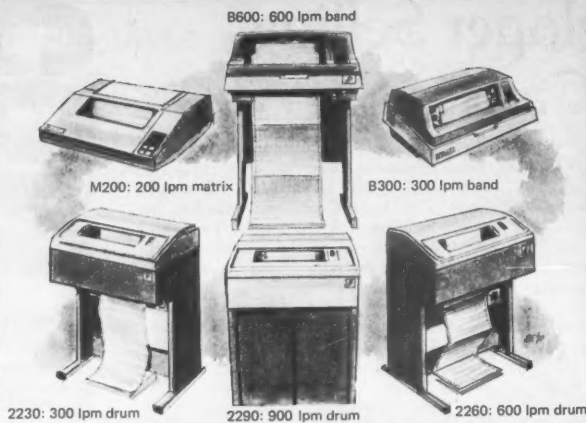
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Datatrol RS7000 Designed For Customized Solutions

HUDSON, Mass. — The newly introduced Datatrol, Inc. RS7000 is the first in a series of systems electronic cash registers designed to provide customized solutions for retail data collection problems in large specialty store chains.

The RS7000 is a multifunctioned point-of-sale (POS), data collection terminal, which can operate either stand-alone or in a clustered configuration.

Retail management can be provided with up-to-date information, such as traditional cash receipts usually associated with an electronic cash register, as well as noncustomer transaction data.

As a stand-alone unit, the terminal requires no external controller and allows data preprocessing without a mainframe computer. In a clustered configuration, an unlimited number of



The Datatrol, Inc. RS7000

external devices can attach to the network to provide expanded terminal intelligence and systems capabilities.

Cost of the RS7000 ranges from \$3,500 to \$7,000, depending on user-selected terminal configurations and options. Datatrol is located at Kane Industrial Drive, Hudson, Mass. 01749.

Developer Sells Services

(Continued from Page 73)

solved for LCACS is how to ensure acceptable reliability. "Attention must be given to alternate path network routing in the event of plant outages so that signal can be continued beyond the point of the outage and the outage can be isolated," Leininger said.

Another problem is deciding who will own and be legally liable for what in the LCACS network, since much equipment will be installed and maintained on tenant premises.

Further, Las Colinas has yet to resolve the problem of finding an appropriate data communications network architecture. "There are very few firms and individuals capable of undertaking the overall development of a broadly defined mixed use broadband coaxial network capable of handling video, audio and data," Leininger observed.

The Las Colinas general manager projected that hardware and software necessary to support a fully operational broadband communication network will not be available in quantity until late 1983 or 1984. Moreover, the software underpinnings for the planned Viewdata-type data base ser-

vices will be in limited supply until late 1982 or 1983.

Leininger charged that cable companies are not prepared to merchandise and support interactive services in the near future because their personnel lack necessary technical expertise, their marketing departments have yet to determine how to package interactive services for end users and salesmen and support personnel "have virtually no experience in actual sale and support of these services."

Leininger also asserted that the two-way coaxial cabling necessary for interactive processing will not be available in quantity until the 1984-1985 time frame.

LCACS services to residences will typically start at \$48 per month and range up to another \$100 per month for the word processing services demanded by businesses, Leininger estimated.

Pilot projects in such services have demonstrated that some affluent households will buy the full gamut of services, which include a number of video entertainment and games offerings, no matter what they cost, he told the session.

SNA-Compatible CRTs Out

(Continued from Page 73)

297 displays, which were offered with Northern Telecom's older Model 296 and 291 on-line systems.

The Sprinter printers, with speeds of 72-, 144- and 18- char./sec, can perform all SNA character string print functions, the spokesman said.

The purchase price of a typical Model 296C configuration, including four 1,920-char. display stations and a 144 char./sec Sprinter, is \$18,000. Comparable monthly lease rates for one-, two- and three-year contracts are \$532, \$441 and \$413, respectively, including maintenance. First customer shipments will begin this month.

A typical Model 294C configuration, with eight 1,920-char. display stations and a 144 char./sec Sprinter, has a purchase price of \$33,410. Its comparable monthly lease rates are \$992,

\$808 and \$755, including maintenance. First customer shipments of these controllers will begin in February.

Northern Telecom Electronic Office Systems division is at International Plaza, Nashville, Tenn. 37217.

Cobar Cuts Price 10% On CRT Terminals

ANAHEIM, Calif. — Cobar, Inc. has announced a 10% price reduction on its Model 3132 CRT terminal, which emulates the Digital Equipment Corp. VT100 and VT132.

The new price is \$1,795 for single terminal orders, with additional volume discounts, a company spokesman said.

Additional information is available from Cobar at 1181 Fountain Way, Anaheim, Calif. 92086.

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Intel Micro-Based Multiplexer Bows

ANDOVER, Mass. — Intel has unveiled a microprocessor-based statistical multiplexer that, combined with

the firm's high-speed modems, reportedly replaces asynchronous low-speed data lines and modems with a single

high-speed line and an associated modem pair.

The SMX8000 features firmware that ensures it will remain transparent to each asynchronous line user while providing use of the high-speed line, the vendor claimed.

Available in 4- or 8-channel versions, the product concentrates up to 8 asynchronous lines into a single, high-speed asynchronous data stream, a spokesman said. It can also multiplex data from a group of asynchronous devices having an aggregate data speed of two, three or four times the rate of the high-speed data channel, he said.

An 8-channel stand-alone model costs \$2,675 and a similar rack-mounted version costs \$2,475, the vendor said from 6 Shattuck Road, Andover, Mass. 01810.

Formerly Special-Order Modems Now Standard From Racal-Milgo

MIAMI — A modem series previously available on special order only will now be offered as a standard product by Racal-Milgo, Inc.

The microprocessor series MPS 9601, 7201 and 4801 high-speed modems with RS-232C-type interfaces will now be offered with RS-449 interfaces as a standard product.

These modems will continue to be offered in standard form with RS-232C-type interfaces, which have 25-pin connectors and a modem-to-terminal distance of 50 ft. The newly standardized RS-449 interfaces, which are

available with single-port or multiport modems, have 37-pin connectors and a modem-to-terminal distance of more than 2,000 ft.

The RS-449 interface will be priced approximately 5% higher than those with the RS-232C-type interface. As an example, the 9601 multiport with RS-232C costs \$7,200 and the comparable RS-449 costs \$7,500.

Racal-Milgo is located at 8600 N.W. 41st St., Miami, Fla. 33166.

New York To Host Meet

CAMBRIDGE, Mass. — The second annual symposium on "Integrating Business Machines into Local and Intercity Networks," sponsored by The Yankee Group, is slated for April 14-15 in New York.

The seminar will analyze the dynamics of the marketplace and the competitive strategies of the leading companies, delineate specific product and service opportunities and examine current and future user needs.

The seminar costs \$725 with \$100 reductions for additional registrants from the same company. It will be held at the Harvard Club in New York and more information is available from The Yankee Group, P.O. Box 43, Harvard Sq., Cambridge, Mass. 02138.

Envax 500 Gets Link to Infocom

IRVING, Texas — Vardon & Associates, Inc. has added an enhancement to the Envax 500 Series, making the devices compatible with Western Union's Infocom Service.

The Envax 500 is a data storage device that can communicate over the Telex or TWX and DDD networks, in addition to Infocom. Standard configuration is 16K bytes of random-access memory, which allows incoming messages to be stored while outgoing messages are being prepared. Other features are keyboard dialing, automatic retries and delayed transmission.

It interfaces with any RS-232 terminal and is compatible with all classes of Infocom service. The price will be increased somewhat for certain configurations, the vendor said from 1401 Walnut Hill Lane, Irving, Texas. 75062.

BDS-1 Converter Compresses Data

ESCONDIDO, Calif. — DEI Teleproducts is offering a data compression option with its BDS-1 asynchronous-to-synchronous converter.

The Data Compression Option enables word processing equipment utilizing 9-bit information fields to interface with statistical and time-division multiplexers that can handle only 8-bit information fields.

In the data compression mode, the unit acts like an Ascii to Ascii converter, accepting the 9-bit field and start and stop bits from the terminal, compressing the field to eight bits and transmitting the 8-bit character to the channel module of the multiplexer. At the opposite end, the process is reversed and the reconstructed character is transmitted to the associated terminal equipment.

In the asynchronous to synchronous mode, the BDS-1 accepts asynchronous data from the terminal and transmits it to its associated high-speed synchronous modem utilizing the modem's clock. At the remote end, the process is reversed.

The BDS-1 costs \$295 from the vendor at 2128 Vineyard Ave., Escondido, Calif. 92025.

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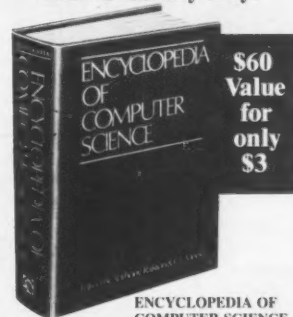
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Teleprinter Corp. Adds Telexes, Teleprinters

BERKELEY HEIGHTS, N.J. — Teleprinter Corp. of America has added a series of electronic telex and private-wire teleprinters to its existing line of equipment and printer services.

The electronic printers cut message time in half and sustain off-line speed of 30 char./sec, the firm claimed. They feature a Selectric-type keyboard and have the ability to receive and prepare messages.

The teleprinters, which can be customized to fit user needs, can be adapted to TWX, DDD, private-wire or computer peripheral applications.

The units range in price from \$3,200 to \$6,200 from the firm at 550 Springfield Ave., Berkeley Heights, N.J. 07922.

Typewriter-Style Layout

Membrane-Key Keyboard Units Debut

GRANDVIEW, Mo. — A compact keyboard display terminal unit that contains 53 membrane keys in a typewriter-style layout is available from Computerwise, Inc.

The Transterm 1 utilizes a 64-char. 5-in. by 7-in. dot ma-

trix liquid crystal display organized in two 32-char. lines with an underscore cursor. The displayable character set is the standard 96-char. Ascii complement.

The unit communicates in full-duplex RS-232 serial asynchronous Ascii with

20mA current loop or RS-422 available as options. Switch-selectable transmission rates of 300-, 1,200-, 2,400- and 9,600 bit/sec are included.

The price of the unit is \$449, the vendor said from 4006 E. 137th Terrace, Grandview, Mo. 64030.

Store Manager Handles Cash Registers, Inventory

SUNNYVALE, Calif. — Store Manager, a turnkey cash register data collection and inventory control system, has been introduced by Lazor Systems, Inc.

Transactions entered at one or more programmable cash registers are recorded in the system's master file to produce updated detailed or summary reports of inventory status, items to be reordered, cost and pricing data, returns, sales to date for the year or any specified period, high- and low-activity items, inventory turn, departmental summaries and other retail management information.

In addition to printed reports, the system can display answers to specific queries about time status, pricing and other necessary information.

The system includes up to 15

programmable cash registers, an Intel Corp. 8086 16-bit microprocessor, CRT display, two disk drives with 2.4M-byte double-sided, dual-density flexible disks, a 150 char./sec printer and software packages for operating system, Basic programming and specialized Store Manager applications.

The suggested price for Store Manager including one programmable cash register, CPU, CRT display, two flexible disk drives, printer and complete software is \$19,750. The vendor can be reached at 1050 E. Duane Ave., Sunnyvale, Calif. 94086.

Teletype 43s Get Buffer

PORTLAND, Ore. — Edge Technology has announced a buffered telex enhancement for Teletype Corp. Model 43 terminals.

The Telexbuffer-43 provides internal buffer and off-line editing capabilities. It features automatic dialing and uses electrically alterable read-only memory (Eaom), the vendor said.

Telexbuffer-43 is available with memory sizes from 2,048 to 16,384 characters and is priced from \$520, the vendor said from 2735 S.E. Raymond, Portland, Ore. 97202.

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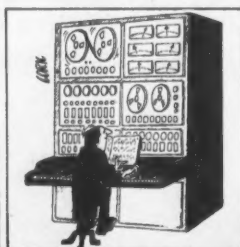
Link Analyzer Displays Errors, Measurements

ALTAMONTE SPRINGS, Fla. — A data link analyzer said to simultaneously display 12 line measurements and test parameters has been unveiled by Epicom, Inc.

The Epilert Model 301 reportedly detects and displays bit errors, block errors, block count, RTS/CTS delay, loop delay, percent peak distortion, Telco db, sync loss, percent present distortion, transmit clock rate, receive clock rate and dc voltage.

The unit is applicable on voice-grade data circuits, digital and microwave links, modems, multiplexers and other data communications equipment, a spokesman said.

Rack-mountable and portable, the unit costs \$3,900 from the firm at 592 N. Douglas Ave., Altamonte Springs, Fla. 32701.



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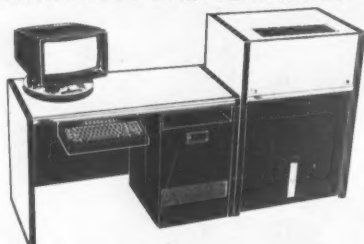
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AJ Announces Terminal Option, Desktop Teleprinter, Price Cut

SAN JOSE, Calif. — A desktop teleprinter terminal designed for business communications and general-purpose DP applications has been announced by Anderson Jacobson, Inc. (AJ).

The company also announced an IBM 2741-compatible communications option for the Model 510 CRT terminal and a price cut on the AJ 1234 coupler.

The AJ 880 printer terminal features print speeds selectable from 10- to 30 char./sec, RS-232C communications interface and transmission rates from 110- to 300 bit/sec.

Operating in either Bell 103 full-duplex or full-duplex with local echo mode, the Digital Equipment Corp.-compatible teleprinter leases for \$70/yr or sells for \$1,295.

AJ 510 Option

In addition to the editing and communications capabilities of a standard Ascii CRT terminal, the AJ 510 with IBM 2741 compatibility offers full graphics and APL character sets with switch-selectable communications in Ascii, or

Interface Links Kodak IMT To 3270 Terminals

ROCHESTER, N.Y. — Eastman Kodak Co. has announced an interface that allows Kodak IMT microimage terminals to receive microimage retrieval commands from IBM 3270 terminals.

The Kodak Model 78 is reportedly compatible with IBM's SDLC protocol and IBM's 3274 control unit, the 3276 control unit/display station and the 3278 display station. The interface costs \$2,510 from 343 State St., Rochester, N.Y. 14650.

IBM 2741-compatible EBCD or correspondence transmission modes, the vendor claimed.

The basic terminal costs \$1,995 and the communications option, \$520. The two are available on a 12-month lease for \$110/mo, the vendor said.

The company also announced it has cut by 10% to

15% the price of the AJ 1234, a 1,200 bit/sec acoustic coupler compatible with the AJ 1256 and the Vadic Corp. VA 3400 series modems.

The AJ 1234 now costs \$795; for quantity orders, the reduction ranges from 10% to 15% over current list prices, a spokesman noted from the firm at 521 Charcot Ave., San Jose, Calif. 95131.

Voice/Data Mux Offered

FORT WASHINGTON, Pa. — A voice/data multiplexer that allows transmission of voice, data or simultaneous voice and data in systems of two to 24 channels has been introduced by Aydin Monitor Systems, Inc.

The Model 6223/6224 System Tailored Voice/Data Multiplexer is applicable in digital satellite communications systems. The 6223 and 6224 differ only in frame/overhead structure, a spokesman said.

The unit features the use of only the bandwidth required to accommodate the voice or data traffic for which the multiplexer is configured.

Prices for the units range from \$8,385 to \$12,815 from the firm at 502 Office Center Drive, Fort Washington, Pa. 19034.

Now you can watch your four favorite programs...

The new HP 2626 display station will give you a view of your computer system you've never seen before.

It lets you divide the screen into as many as four separate "frames," each attached to a different workspace in the terminal's memory. You can check a program listing in one frame and access a file in another. Fill out a form in one workspace while the computer loads the next form into another. Or do text preparation and editing in adjacent frames.

What's more, you can set line lengths of up to 160 characters in any workspace. Then scroll horizontally to get the entire picture. (The built-in thermal printer includes a compressed mode that prints up to 132 characters per line.) Scroll vertically, too, or change the size of the frame at the touch of a key.

Split decisions.

The HP 2626 has two data communications ports instead of one, so you can hook up the terminal to two computers at the same time (or to the same one twice). Then, it's like getting a multi-tasking capability right in the terminal—your systems designer can compile, execute, monitor and edit programs as if two stations were available.

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And while your user is filling out a form, the terminal can be sending data from the previous form to a computer. And down-loading the next form into an adjacent workspace. By smoothing out the "type and wait" of data entry, you can take advantage of less expensive, low-speed transmission lines without sacrificing the efficiency of your operator. The result? You'll get more out of the entire system.

If you'd like to watch a program on the new HP 2626 display station, or any of our terminals, just call your local HP sales office listed in the White Pages. You can also write for more information to Hewlett-Packard, Attn: Tom Anderson, Dept. 389, 974 East Arques Ave., Sunnyvale, CA 94086.



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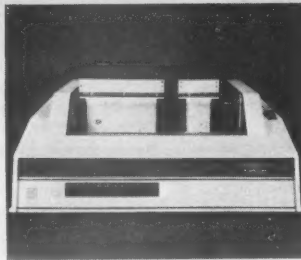
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Terminet 200 Allows Printing Of Two Forms

WAYNESBORO, Va. — The Data Communication Products Business Department of General Electric Co. has introduced Terminet 200, a split-platen line printer that allows users to independently print two forms simultaneously.

The printer offers operation at up to 9,600 bit/sec at a maximum speed of 200 char./sec. Strappable selections provide for operations at 110-, 150-,



Terminet 200

200-, 300-, 600-, 1,200-, 2,400- and 4,800 bit/sec, the vendor said.

Terminet 200 costs \$3,895.

The vendor is headquartered at Waynesboro, Va. 22908.

Printer Sets Terminal Data

DALLAS — Mepcom International, Inc. has announced a dot-matrix impact printer that is said to offer economical data printing capabilities to any CRT terminal.

The EZ Print 21, designed primarily for small-screen CRT terminals, records an audit trail of all terminal data on a standard adding machine paper tape, a company spokesman said.

The desktop printer patches into an RJ11C modular or RS-232C interface outlet.

It prints in a 21-col format at a maximum throughput rate of 42.5 char./sec. A buffer allows input at 120 char./sec.

The unit costs \$395. Mepcom International is at Suite 301, 2619 Electronic Lane, Dallas, Texas 75220.

Traders Get Space Saver

NEW YORK — Arbat Systems Ltd. has announced Space Saver, a trader's CRT terminal that reportedly can be linked to both the Arbat Banking System and various financial services.

With Space Saver, the CRT terminal is now divided into three components: a screen as small as seven inches or as large as 22 in., a separate keyboard with specialist trader's function keys and the microprocessor-controlled systems interface unit, an Arbat Systems spokesman said.

The Space Saver is priced at \$3,150, monitor screen included.

Arbat Systems Ltd. is headquartered at 5 Hanover Sq., New York, N.Y. 10004.

Systems Technology Forum Expands Winter Program

BURKE, Va. — Systems Technology Forum has expanded its winter program to start earlier in the year and to be available for the first time in Houston, Phoenix and Boston.

The seminar program previously was available only in San Francisco, Los Angeles, Chicago, Atlanta, New York and Washington, D.C.

Courses include an introduction to data communications, network design, corporate network strategies, introduction to business telecom-

munications and communications technology trends.

Aimed at the novice, the advanced and the manager, courses may be taken separately or in recommended combinations, and each curriculum has been developed to meet particular job function criteria, the firm said.

Each seminar covers three days with prices ranging from \$650 to \$750. The firm is located at 8991 Cotswold Drive, Burke, Va. 22015.

Communications Manual Available

LOMBARD, Ill. — A manual offering a methodology for defining, planning, controlling, developing and implementing data communication systems is now available from Cara Corp.

The manual is a compilation of the efforts of individuals with more than 200 man-years of data communications experience, a Cara spokesman

said. Over 1,500 hours have been spent translating these detailed topics into terms useful and meaningful to corporate and DP management, he claimed.

The manual, "Data Communications ... Survey & Procedures," costs \$795. Cara is in Suite 110, 611 E. Butterfield Road, Lombard, Ill. 60148.

Retro-Graphics Added to VT100

SACRAMENTO, Calif. — Digital Engineering, Inc. has announced the Retro-Graphics enhancement for the Digital Equipment Corp. VT100 CRT terminal. Features of the upgraded VT-100 include multiple character sizes, dot-dash lines, point plotting, vector drawing and selective erase for updating the graphics display, the vendor said.

Graphics are displayed in green tone on the 12-in. nonglare screen at 640 by 480 resolution, the vendor said.

The VT-100 is reportedly compatible with most existing graphics software including Tektronix, Inc. Plot-10 and Isco's Displa and Tellograf.

The terminal costs \$3,495 from Digital Engineering, Inc., 630 Bercut Drive, Sacramento, Calif. 95814.

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Becomes First IPL 4443 User Firm Finds Shipment Delay Pays Off

Special to CW

HOPKINTON, Mass. — To a deadline-pressured user, extended equipment delivery dates are anathema. For a service bureau and facilities manager here, however, the future shipment shuffle paid off.

Data Distributors, Inc. (DDI) reportedly doubled its throughput by replacing its overworked IBM 370/145 with an IPL Systems, Inc. Model 4443 processor. The company had ordered an IBM 4341, but became the first end user of the 4341-1-compatible mainframe when IBM assigned a delivery date that would have had DDI waiting for more than a year.

"We considered leasing a 370/158 for the interim, but it had too many drawbacks, like high maintenance costs and inefficient power and space requirements," Roger Challen, DDI's president, stated. "We decided instead to look for a machine that had the potential to grow with us."

DDI is a fast-moving company that handles a variety of diverse on-line and batch-processing applications. Currently, the firm serves as facilities manager for Super Mar-

ket Distributors Corp., taking care of on-line inventory, billing and sales analysis for thousands of rack items for the company's more than 2,000 northeastern supermarket customers.

As a service bureau, DDI has its processing hands in on-line data base management, payroll and accounting applications and investment portfolio management, Challen noted.

Obsolete Processor

According to DDI's president, the firm learned quickly that its IBM 370/145 was fast becoming obsolete as a processing tool.

Basically, the IBM processor "was causing degraded response time on information important to our customers," Challen pointed out. "It simply didn't have sufficient cycle time or memory to support our requirements, much less handle additional applications."

At the time, DDI was working with Business Systems Associates, Inc. (BSA) another service bureau, to establish a joint data center. BSA was then performing batch processing of material requirements planning,

materials management and shop-floor scheduling for a number of major electronics firms.

"Since they were developing a major on-line manufacturing system, the need for more computing capability was critical," Challen noted.

Options Reviewed

It was then that DDI reviewed its alternatives. The company contacted several plug-compatible vendors, including IPL, and also sought to improve the delivery date on the IBM 4341.

Unfortunately, IBM refused to budge the distant delivery schedule, which forced Challen to reassess his plug-compatible alternatives.

DDI contacted IPL, worked out the contractual details and in May became the IPL 4443 beta test site. Presently, DDI's system is equipped with 2M bytes of memory, four block multiplexer channels and one byte multiplexer channel for communications, 10 3350-type disk drives and four tape drives. However, the disk and tape units will soon be replaced by Storage Technology Corp.

(Continued on Page 80)

Honeywell Warns Of Fire Hazard

WALTHAM, Mass. — To deal with a potential fire hazard, Honeywell, Inc. has issued a field engineering change order that modifies the static eliminator bars on the company's drum printers manufactured since 1966.

The bars, when used in conjunction with nonfused transformers, may cause an electrical breakdown in the end piece area and possibly generate heat sufficient to cause a fire hazard, the company said.

The company said it will, wherever needed and at no charge, replace non-fused transformers with fused ones; replace the static bars and end pieces with ones manufactured of nonflammable materials; and relocate the bars from below the paper path to above it.

The company has urged all Honeywell drum printer users to contact the nearest Honeywell engineering or sales office to see if their drum printers require modification.

System Integrates Financial Tasks

WINTER PARK, Fla. — A computer system designed to integrate the back-office operations, planning and marketing services of financial institutions has been announced by Systeme Corp.

The Financial Information and Control System (Fics) includes six subsystems: Financial Planning and Modeling, Total Loans in Process, New Account Processing, Wordplus (word processing), Electronic Mailbox and General Accounting.

Users can incorporate all or some of the subsystems, expandable or modifiable at any time. Fics features an integrated information base shared among all subsystems.

Fics reportedly can interface with all central computer systems currently used by financial institutions. With many hardware and software options to choose from, systems range in price from \$75,000 to \$450,000, depending on the number of terminals and subsystems desired, a spokesman said from 1095 S. Semoran Blvd., Winter Park, Fla. 32792.

Group Formed For Managers Of Operations

SANTA ANA, Calif. — Data Center Management Services has announced the formation of the Association for Computer Operations Managers (Acom), reportedly created to meet the needs of the professional computer operations manager.

In its bimonthly publication, "The Computer Operations Manager," Acom will address both the latest state-of-the-art technology and management techniques available to operations managers, Acom said.

Acom members will be sent an annual salary survey of computer operations positions, and the association will also host special conferences dealing with computer operations.

Charter membership for one year is \$115. Data Center Management Services is at 3605 E. South Bristol, Santa Ana, Calif. 92704.

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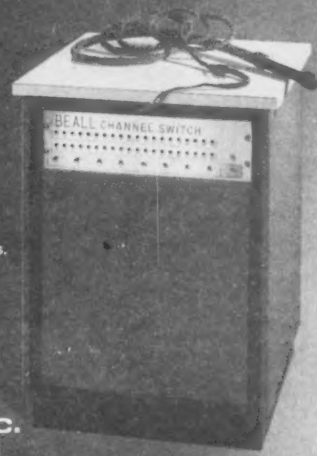
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The Burroughs S4100

Burroughs Offers Document System

DETROIT — Burroughs Corp. has introduced a multipocket, document proof and encoding system called the S4100.

The S4100 was designed to help financial institutions process checks, credit card receipts, utility bills and other kinds of payment documents.

The controls, operator display and master printer are grouped into one unit in order to minimize operator head and eye movement, a Burroughs spokesman said.

Both the "burst printer," which prepares detail lists and audit information at speeds of 2,200 char./sec. and a micro minidisk unit for loading programs and storing data are located within reach of the operator, the spokesman continued.

With the S4100 is a software installation kit containing software, system disks and documentation, which will enable a Burroughs field representative to install the system as soon as it arrives at the customer's site, Burroughs claimed.

Deliveries of the S4100 will begin immediately. The system can be purchased for \$20,990 or leased for \$678/mo on a three-year lease, including maintenance.

Scanning System Handles Business Inventory Control

EUGENE, Ore. — A microprocessor-based scanning system for business inventory control has been developed by Western Computer Systems, Inc.

Utilizing hardware based on the Alpha Microsystems, Inc. 15-bit microprocessor chip set, the Model 580 can

be used with hand-held wand and tabletop laser scanners to read UPC and other bar code symbols.

Systems range from \$10,000 to \$90,000, depending on disk storage, number of terminals and printers, processor speed and software customization.

Western Computer Systems is headquartered at 1000 Bertelsen, P.O. Box 10191, Eugene, Ore. 97402.

Seminars Target DP Professional

WELLESLEY HILLS, Mass. — Management Advisory Services and Publications is offering a series of seminars on DP auditing, security, control and system quality assurance.

Taking place in Boston, New York, San Francisco, Washington, D.C., Miami and Minneapolis, the seminars range in price from \$390 to \$840.

The firm also offers a series of publications on computer security that range in cost from \$35 a year to \$495 a year.

More information is available from the firm through P.O. Box 151, Wellesley Hills, Mass. 02181.

Shipment Delay Pays Off

(Continued from Page 79)

3350-type spindles and 4500 series tape drives, Challen said.

DDI selected the IPL 4443 over other plug-compatible competitors because of IPL's successful emulation of IBM's 4300 microcode on the new machine. Challen was also familiar with the design reputation of IPL's Omega 480-3 processor, supplied to Control Data Corp., whose modified architecture is incorporated into the 4443.

Performance, Upgrades

Finally, DDI also chose the IPL system because of the processor's performance capabilities and ease of upgrade.

"The 4443 gives us the option of up to 8M bytes of memory, which is double the capacity IBM offers. When we upgrade, IPL will let us do it in the field," Challen indicated.

DDI's system currently runs VM, DOS/VS and DOS/VSE, Vsam, Vtam and local and remote CICS, Challen added.

Also, in addition to investigating packaged data base systems, the company's plans for the future call for two production systems using DOS/VSF releases 2 and 3 for both on-line and batch processing, a company spokesman indicated.

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Portable System Repairs Printed Circuit Boards

LAUREL, Md. — A self-contained, portable system for printed circuit board (PCB) field repair is available from Pace, Inc.

Designed for repair and field service organizations, the 4.5-pound Pace Micro unit may be carried by hand or in a tool case along with a full complement of tools, the vendor claimed. A single handpiece performs both desoldering and soldering operations using interchangeable tips, with full temperature regulation.

The product can operate from either standard ac line sources or from 12 Vdc power and costs \$395, the vendor said from 9893 Brewers Court, Laurel, Md. 20810.

Graphics Option Offered For Media 12/7 Printer

NASHUA, N.H. — Sanders Technology is offering a graphics option for its Media 12/7 typographic printer that allows line drawing and coarse grayscale drawings to be created on the printer.

The graphics option consists of a memory expansion board, two graphics fonts and special version of the printer software.

The graphics option is available for \$500, the vendor said from Box 1226, Nashua, N.H. 03061.

Reference Charts Provide Forms and Media Specs

ARLINGTON, Va. — A series of five Quick Reference Charts reportedly providing access to forms and media specifications on the range of forms-using devices is now available from International Business Forms Industries, Inc.

The charts detail information on line printers, matrix printers, character printers, optical scanners and forms handling equipment.

The charts, prepunched for notebook reference, are priced at \$8.50 each, or \$40 for the set of five with quantity discounts available from the firm at 1730 Lynn St., Arlington, Va. 22209.

Methodology Aids Planning, Design, Upkeep of Systems

CHICAGO — A methodology for planning, designing, implementing and maintaining information processing systems is available from Arthur Andersen & Co.

Method/1, consisting of books, training, on-site installation and consulting services, is aimed at both small and large systems environments, according to a company spokesman.

A minimum cost of \$30,000 — which buys the methodology and its installation — "could increase substantially" depending on the needs of the user, the spokesman explained from 69 W. Washington St., Chicago, Ill. 60602.

Compuscan Ties Alphaword, CPT 8000 Word Processor

TETERBORO, N.J. — Compuscan, Inc. is offering an interface that connects the firm's Alphaword OCR page reader with the CPT 8000 word processor.

The interface allows text typed on IBM Selectric or other single-element

typewriters to be input directly into the word processor without keying, the vendor said.

The interface costs \$2,000. Compuscan is located at Huyler St., Teterboro, N.J. 07608.

Copy of Graphics Newsletter Available for Free Trial

IRVINE, Calif. — A free copy of the "Computer Graphics Technology Newsletter" is available from Computer Graphics Technology Co. A full subscription costs \$68 annually.

The newsletter is written to keep readers informed of financial, hardware and software changes within the industry.

Computer Graphics Technology Co.

is located at 14632 Comet St., Irvine, Calif. 92714.

Hollerith Tab Card Reader Handles up to 22 columns

MAMARONECK, N.Y. — A Hollerith tab card reader that can read up to 22 columns of alphanumeric punched hole information has been introduced by Sealectro Corp.

The DSR-100 utilizes photo transistors to sense holes on cards that are manually inserted and read one at a time.

Light excitation is by means of multiple LEDs.

The unit costs \$267 from Sealectro Corp., Mamaroneck, N.Y. 10543.

Course Slated On IBM 4300

LOS ANGELES — THE IBM 4300 series and how it fits in with IBM's ideas about centralized data processing will be the topic of a three-day seminar organized by Technology Transfer Institute.

The seminars will be held today through Wednesday in Washington, D.C., and Feb. 2-4 in San Francisco.

Frederic Lamond, an independent consultant and contributor to the computing press, will lead the seminars. According to the organizers, he has completed an in-depth study of the IBM 4300 series.

Registration costs \$675. More information can be obtained from Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.



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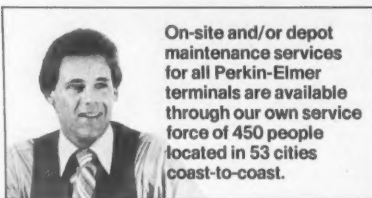
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PERKIN-ELMER

At Special Needs Home

Mini Helps Modify Children's Behavior

Special to CW

SACO, Maine — At first glance, computers and child care seem an odd match. There is nothing more impersonal than computers and nothing more personal than taking care of children.

However, a children's home here has successfully incorporated a minicomputer into its behavioral motivation program and uses the machine to custom-tailor the education of 65 special-needs children.

The Sweetser-Children's Home is a live-in treatment center for emotionally disturbed children that started as an orphanage in the 19th century. Residents consist of boys and girls ranging in age from six to 18, each with unique behavioral problems and learning difficulties.

Before turning to a computer, the home's staff processed data and tracked the learning progress of each child with a slow and time-consuming manual system. Since motivational programs changed about two to four times a month as goals were completed and new ones established, the manual system consumed enormous amounts of time, according to Richard G. Doiron, Ph.D., director of psychological services at Sweetser.

Recently, Doiron transferred the facts and files of his behavioral motivation program to the home's Cado Systems Corp. System 20/IV computer that was previously purchased to handle the organization's book-keeping. The system has one CRT terminal, three floppy disk drives and a 150 char./sec printer.

In addition, the children's home has a second Cado system equipped with a 55 char./sec letter-quality printer that is the heart of Sweetser's fund-raising operations.

Special Needs

At the outset of his unique project, Doiron saw that while the Cado system would provide all of the multitasking capability he needed, there would have to be some additional and very specific programming to handle his program's needs. He met with systems analysts and programmers from Northern Data Systems of Maine, Inc., Cado's Falmouth-based representative, to build the project's programming backbone.

"As far as we could tell from our research, and as far as Sweetser could determine, no such behavioral application was in existence," Charles R. Stevens, president of Northern Data, said. "We had to design it from scratch with Dr. Doiron describing what he wanted to accomplish and our systems people figuring out ways to do it."

The computerized behavioral motivation program begins when a staff member sits down with a child to set three goals for the next week or two weeks, depending on the child. Rather than working with impossible, general ideals such as "I will try to behave," the program hones in on specifics like "I will make my bed before 8 a.m." From a list of 150 specifics, the child chooses three goals for the next period.

Goals are written into a contract, which is signed by both staff member and child. They are also noted on a weekly rating chart, and daily scores are given for each behavior. The system also allows for bonus and penalty points.

Program's Core

This point system is the core of the motivational program, and it is here that the computer does the heavy work. "Children need to know how they're doing on a daily basis," Doiron explained. "A week is a very long time. If they do badly one day, they need to know they can start fresh the next. The

points they earn are entered into a 'bank book' and they can spend them on dozens of activities; everything from a can of soda to a movie to time with a staff member."

Once a week, Barbara Wentworth of Sweetser's staff enters each child's total

'The scores are especially helpful in showing a big change. For example, if we see that a child who has been doing well for several weeks suddenly begins to turn in markedly lower scores, we can take a closer look to find the problem.'

score into the computer. Printouts with information on all children go to the school and various Sweetser staff members so they can have a quick reference to any child's overall performance. Printouts also list scores for the previous reporting period, which allows for an immediate comparison and alerts staff members to major changes.

"The scores are especially helpful in showing a big change," Doiron stated. "For example, if we see that a child who has been doing well for several weeks suddenly begins to turn in markedly lower scores, we can take a closer look to find the problem." The computer also converts the raw scores to percentages, offering another performance index.

Built-in Flexibility

Contracts are also entered into the computer. The program has a built-in flexibility which makes the weekly changes, as well as the personalized behaviors, easy to change. Behaviors are written in "stems" and any personalizing is simply added to the end of the stem. For example, the stem "I will watch my language" can be personalized to

"I will watch my language on the playground."

Once in the computer, the data from the behavioral motivation program can be retrieved in a variety of ways. A Sweetser teacher who wants a quick rundown of the current behavioral goals of her pupils, for example, can call up the information for her entire class simply by feeding in each child's student number.

Student numbers can also be used to pull out a long-term list of goals the child has already met, complete with scores expressed in points and percentages. The data also serves as a backup record in case children lose the "bank books" where their points are stored.

Long-Term Picture

Every six months, the computerized behavioral data is used to prepare graphs showing a child's long-term progress. The graphs become part of a comprehensive picture of the progress of each child.

The graphs developed from the computer data also make vivid illustrations for use in conferences with a child's parents, Doiron said, because the peaks and valleys of a graph can be so quickly grasped. "The computer data has become a key ingredient of the integrated life experience we try to offer," he added.

Finally, the highly specific goals of the motivation program and the idea of daily ratings play a significant role in easing relations between emotionally disturbed children and their parents. "When parents can deal with these specific behaviors, and deal with them every day, they avoid the blow-ups that come of simply expecting a child to 'be good.' By giving parents precise behaviors to focus on, we can help them gain perspective on the child's problems," Doiron said.

Speech Synthesizer Provides Standard, Custom Word Lists

PALO ALTO, Calif. — A speech synthesizer module that reportedly can accommodate both standard and custom vocabularies up to a total of 256 utterances has been developed by Telesensory Speech Systems, Inc. for small systems.

The Series III Speech Module consists of the firm's own speech synthesizer as well as

Series/1 Controllers Get Test Feature

ORANGE, Calif. — MDB Systems, Inc. has unveiled a feature that reportedly enables printer controllers to send a test pattern to the connected line printer (independent or computer operation), which verifies that the interface circuitry of the printer and controller are operating correctly and the interconnecting cable is not damaged.

Printtest solves a problem for the system user who may have a self-testing feature on his printer, but has been unable to test the interface drivers, receivers and connectors, the vendor said.

The product was designed for the vendor's line of IBM Series/1 printer controllers having Centronics Data Computer Corp., Data-products Corp., and Data Printer-type interfaces.

It costs \$1,995, the vendor said from 1995 N. Batavia St., Orange, Calif. 92665.

vocabulary data memory, an on-board speech filter and an audio amplifier.

The unit's TTL-compatible I/O and +5V single supply are said to simplify interfacing the module to a microcomputer. The memory can be any combination of one or two 16K, 32K or 64K read-only memory (ROM) or programmable read-only memory (Prom) providing up to 128K bits, a company spokesman said.

The basic unit costs \$295 and is able to store approximately 100 seconds of speech in ROM memory for retrieval on command. With 16K of ROM, it costs \$320, with 32K of ROM, \$345 and with 64K of ROM, \$395 from 3408 Hillview Ave., P.O. Box 10099, Palo Alto, Calif. 94304.

TI-Mix Meet Set For March 8-11

AUSTIN, Texas — TI-Mix, the users group for Texas Instruments, Inc. users, will sponsor a conference March 8-11 at the Marriott Hotel in New Orleans.

The conference will feature 66 customer exhibits, 36 sessions, panel discussions, workshops and more than 100 individual presentations.

The conference costs \$120 per person with early registration and group discounts available. TI-Mix can be reached through P.O. Box 2909, M/S 2200, Austin, Texas 78769.

MINI-MIX

ABC Bundles HP-1000L

TAHOE CITY, Calif. — ABC Computers, Inc. is offering Hewlett-Packard Co.'s 1000L computer system bundled with ABC Business accounting software through its authorized dealer program.

The basic system is shipped with 128K bytes of memory that is expandable to 512K bytes.

The system includes the 1000L processor; 15M bytes Winchester; tape backup; video CRT terminal high-speed printer; HP's RTE-XL multiuser operating system; and business applications from ABC.

The system costs less than \$20,000. ABC computers can be reached through Box 7529, Tahoe City, Calif. 95730.

Minis, Micros Get UPS Series

NUTLEY, N.J. — The first of the Mintaur series of uninterruptible power systems (UPS) for minicomputers and microcomputers has been announced by Nova Electric Manufacturing Co.

The 2.5 kVA system provides 125% overload for 15 minutes, 150% for one minute and 1,000% for five cycles via the solid-state transfer switch, the vendor claimed.

The system, which can be mounted in a standard 19-in. equipment rack, was also designed for use with process control systems, communications systems or as a portable power source.

The UPS is priced at \$4,275 from Nova Electric Manufacturing Co., 263 Hillside Ave., Nutley, N.J. 07110.

Mini Bits

Disk Interface Boards Out For ModulusOne Bus

EMERYVILLE, Calif. — A line of disk storage interface boards, reportedly fully compatible with the company's 6802- and 6809-based ModulusOne-bus modules, is available from Adaptive Science Corp.

The line consists of three modules: Module 750 interfaces the 5.25-in. Shugart 400 floppy disks drives; Module 1350 interfaces to the Shugart 9800 and equivalent 8-in. floppy disk; and the Module 1360 interfaces to the Micropolis 1220 Winchester hard-disk drive.

The 750 costs \$225, the 1360, \$230 and the 1350, \$325.

Adaptive Science Corp. is headquar-

tered at 4700 San Pablo Ave., Emeryville, Calif. 94608.

Dot Matrix Printer Offered By TEL for Small Systems

HOUSTON — A small systems dot matrix printer encased in a sound-proof, wood-grain lowboy cabinet has been introduced by TEL, Inc.

The Model 3432 features up to 136-column printing at 150 char./sec. and 9- by 7-in. dot format to form 94 Ascii characters, including lowercase letters with descenders, symbols and double-wide characters.

Featuring bidirectional printing under microprocessor control, Model 3432 costs \$1,995 from 5075 S. Loop E., Houston, Texas 77033.

A PICTURE IS WORTH A THOUSAND WORDS.

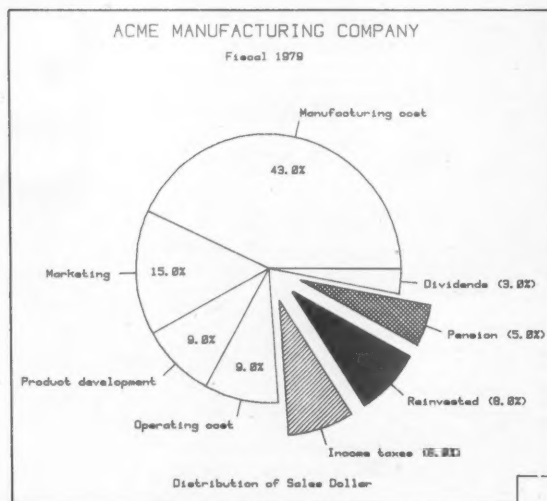
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(This reply coupon was generated by Timberline's Graphics Package using an HP 7225A plotter.)

Winchester Disk System

Designed for DEC LSI-11s

SAN JOSE, Calif. — Corvus Systems, Inc. has unveiled a Winchester disk system for Digital Equipment Corp.'s LSI-11 microcomputer.

The 20L directly emulates the DEC RL01 and RL02 cartridge drives and is 100% hardware and software compatible, the vendor claimed. No operating system modifications are required and only a single quad-size interface is used to the Q-bus.

The system costs \$6,950, the vendor said from 2029 O'Toole Ave., San Jose, Calif. 95131.

SSM Provides Z80 Board For S-100-Based Systems

SAN JOSE, Calif. — A Z80 MPU board for S-100-based systems is available from SSM Microcomputer Products.

The CB2 features firmware vector jumps and an output port to control eight extended address lines. These permit the use of more than 64K bytes of additional memory with the CPU board, the vendor claimed.

The board costs \$654 from the vendor at 2190 Paragon Drive, San Jose, Calif. 95131.

Motorola Exorcisor I Gets Memory System

WESTLAKE VILLAGE, Calif. — A memory system designed for use with Motorola Corp.'s Exorcisor I, Exorcisor II and Rockwell International, Inc.'s System 65 has been announced by Chrislin Industries, Inc.

The CI-6800-2 memory is available in 16K-, 32K-, 48K- or 64K-byte configurations.

Its prices range from \$565 to \$750. Chrislin is at No. 102, 31352 Via Colinas, Westlake Village, Calif. 91361.

LSI-11, Versatec Gear Tied

SANTA CLARA, Calif. — Versatec, Inc. is offering a single-board interface that reportedly allows Digital Equipment Corp. LSI-11 microcomputer systems to use any Versatec electrostatic plotter or printer/plotter, input/output multiplexer, hard-copy controller or vector-to-raster converter. The Model 125 single-board interface provides for printing speeds up to 1,000 line/min and plotting speeds up to 34 sq ft/min, the vendor claimed.

The interface package costs \$1,600, the vendor said from 2805 Bowers Ave., Santa Clara, Calif. 95051.

IBM Net Up 18%, Revenues 14.7%

ARMONK, N.Y. — IBM's net earnings advanced more than 18% during 1980, reaching \$3.5 billion, while revenues grew 14.7% and topped \$26 billion.

Although earnings growth during 1980 was markedly better than 1979, pretax earnings grew 6.2%.

Commenting on the year's results, IBM President and Chief Executive Officer John R. Opel said, "A major factor in the increase in net earnings for the year and for the fourth quarter was the reduction in the effective rate for U.S. federal and non-U.S. income taxes."

For its fourth quarter IBM's revenues grew 14.3%, totaling \$7.8 billion, up from \$6.8 billion in the final quarter of 1979.

Earnings showed a 22.3% increase, rising to \$1.2 billion or \$2.11 per share, up from just over one billion or \$1.73 per share in the fourth quarter last year.

For fiscal 1980, IBM reported revenues of \$26.2 billion, up from \$22.8 billion for 1979. Earnings jumped to \$3.5 billion or \$6.10 per share, a considerable gain from earnings of just over \$3 billion or \$5.16 per share last year.

"Purchases of data processing equipment was considerably higher for the year and the fourth quarter than in the comparable pe-

(Continued on Page 89)

Report Sounds PCM Alarm Over Changes Made by IBM In Software Support Policies

By Jeffrey Beeler

CW West Coast Bureau

SAN JOSE, Calif. — IBM's latest moves to unbundle its operating systems and revise its software support policies have posed a serious new threat to plug-compatible mainframe (PCM) vendors, most of which still fail to understand the full implications of IBM's actions.

The threat to the PCM sector will prove especially pronounced for low-end and medium-scale processor suppliers such as Magnuson Computer Systems, Inc. and Two Pi Co., according to a recent study of IBM's large and mid-range systems strategy.

The study, which was released earlier this month by Strategic Business Services, Inc., traced the PCM vendors' potential difficulties to a recent but profound shift in IBM's software and program support strategy.

The change, which has been implemented in phases in the wake of IBM's 4300 series announcements, is characterized by several key developments:

- The unbundling of the industry giant's DOS/VS, IVM/370 and MVS operating systems.
- The imposition of severe restrictions on

the availability of local support to PCM mainframe users.

- The unbundling of local support involving on-site visits by IBM's Program Support Representatives (PSR).

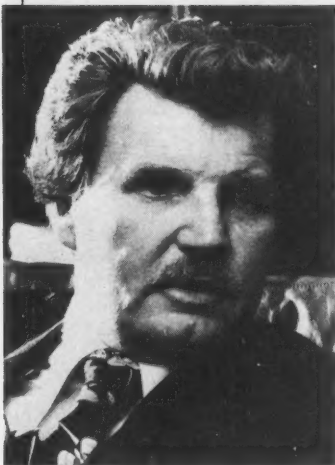
- Creation of a Support Center for diagnosing and remedying program "bugs" over a toll-free phone line.

IBM's latest software unbundling marks perhaps the most significant shift in the company's operating systems strategy in more than a decade, the study said. Before the 4300 series announcements, the System Control Program (SCP) portion of the firm's operating systems was virtually free and incorporated most of the features critical to the software's effective operation.

Today, however, most of those key software features — including job entry, communications support, spooling, disk-systems management and the ability to accommodate multiple partitions — have been removed from the SCP and turned into Program Products (PP) for which all users are required to pay a monthly license fee.

The SCP's transformation from a giveaway to a chargeable item promises to have

(Continued on Page 88)



Thomas M. Nies

Cincom's Philosophy: Innovation

By Marcia Blumenthal

CW Staff

CINCINNATI — Thomas M. Nies, president of Cincom Systems, Inc., likes to summarize the philosophy behind his company in one word: Innovation.

But Nies is not nearly as terse explaining how innovation has helped his software company progress to a \$40 million company since it was founded 13 years ago with \$600.

You can't win in this industry if you merchandise head-on with IBM, Nies stressed. "To survive in the market you have to be two to four years ahead of IBM's product introduction."

The foundation of Cincom's success is its Series 80 Total data base management system. Cincom was not the creator of the data

base concept, but "we popularized the idea back in the late 1960s and early 1970s," Nies said. At that time IBM was not merchandising a data base system.

Until 1974 or 1975 Cincom held about 80% to 85% of the data base market, he claimed. Today IBM and other independents have eroded Cincom's position, but Nies maintained Cincom still holds some 45% of the entire data base market and nearly 65% of the independent (non-IBM) data base market. Today there are 2,700 users of Cincom's Total system.

Communications Monitor

From popularizing data base Cincom continued its leading edge tactics by integrating

(Continued on Page 87)

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Data Base Processor Not Visible In Cincom Systems' Future

By Marcia Blumenthal
CW Staff

CINCINNATI — Although Cincom Systems, Inc. considers itself in the vanguard of innovative software systems, a data base processor is not in the company's future.

Cincom President Thomas M. Nies said the data base processor is "an idea whose time has come and passed."

The bottleneck in processing data base applications is the

input/output function, Nies explained during a recent interview. The average time required to access a disk record is 50 msec, he said, noting that, in the time it takes to access one record, a system operating at 5 million instructions per second could process 250,000 instructions. Offloading the data base function, then, does not greatly improve processing efficiency, he maintained.

Although Nies said he considers data base processors a "marketing ploy," his opinion, in part, may have been formed by the architecture of the company's data base management system, Total.

In general, a chaining system, such as Total or IBM's IMS, is heavily I/O-dependent because it chases pointers through a data base and must access each individual record, according to one industry expert. This type of system is generally more geared to updating files than ad hoc inquiries and therefore is more I/O-bound.

Software AG

However, Software AG of North America, Inc.'s data base management system (DBMS), Adabas, is built on an inverted list structure, which is oriented to questions and queries rather than updating, according to John Maguire, president of Software AG.

His firm introduced its Data Base Machine (DBM) last October, the first one commercially available to end users. [CW, Oct. 27]. The Britton Lee, Inc. system introduced last March is sold on an OEM basis to systems houses, which develop customized front-end interfaces for the machine.

At the time of the introduction of its DBM, Software AG said the system was designed to allow users to offload the DBMS function from the host to avoid "resource saturation." Based on an IBM-compatible processor from Camdex Corp., the DBM sells for between \$300,000 and \$400,000 and is said to improve transaction throughput by 25% over a DBMS running on a nondedicated system.

While Software AG has thrown its hat into the data base processor arena, Intel Systems Corp. abandoned the idea of a data base machine in late 1979. Prior to that time, Intel Systems through its acquisition of MRI Systems, Inc., was eagerly pursuing the data base processor route.

Like Adabas, Intel Systems' System 2000 DBMS has an inverted list structure and would be ideally suited to the data base processor concept, noted Kent Ochel, president of Intel Systems, a subsidiary of Intel Corp.

In reevaluating its approach to a data base processor, Intel Systems found the product would not be profitable enough to market.

Ochel said a data base machine is of limited use unless a major portion of a user's applications are devoted to data base. According to the com-

Cincom's Future Focus: Relational Data Structure

CINCINNATI — What does Cincom Systems, Inc.'s president see as the company's focus for the future?

One thing he sees, Thomas M. Nies said, is a relational data structure, which it will soon introduce. During the 1970s, people argued whether a hierarchical or inverted list structure was better, but "this is ridiculous, because some data structures are good for some applications but not for others," he contended.

Nies sees great opportunities in directory-driven systems, such as the company's Total Information System (TIS), a second-generation data base system. Under a directory-driven system, users' applications programs do not communicate directly with the data base management system.

Instead, the components of the system and a user's applications communicate through the directory. Eventually, using this concept the company may build a product that would allow simultaneous support of multiple data base systems.

A third near-term direction is increased emphasis on on-line systems such as Mantis, which has eliminated the batch processing portion of application development.

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Cincom's Philosophy: Concentrate on Innovation

(Continued from Page 85)

Total in 1971 with an on-line data communications monitor — Series 80 Environ/1. The company never would have competed as successfully against IBM's CICS if Environ had been introduced in 1978," Nies explained.

Still focusing on innovation, Cincom's newly introduced Mantis system, an on-line applications development system, has the capability of replacing Cobol, Nies maintained [CW, Jan. 19].

Nies thinks Cobol, now 20 years old, is in its dotage.

However, being early to market with products has had its thorny moments, Nies said.

"We sometimes have a problem getting users to see the correctness of a product; so in the first two or three years of a product's life we do conceptual selling."

Yet with 66 of the Fortune 100 Cincom users, Nies said the firm is now able to confirm its new product ideas by working closely with these sophisticated users.

Growing on the average of about 30% per year, Cincom's revenue for its current fiscal year should hit \$50 million, up from \$35 million last year.

Cincom is a privately held firm and Nies is not considering taking the company public — a route increasingly being favored by established software firms.

Stress on R&D

By remaining a privately held firm, Nies thinks it is easier to keep the company focused on research and development. While Nies agrees marketing and advertising are important, at this point he does not want to skew the firm's resources toward merchandising.

Right now 30% of Cincom's expenses are for R&D, and an equivalent amount is allocated to marketing and sales. During the past five years R&D expenses have grown 600% while revenues advanced 300%.

This stress on R&D and innovation has made the company's return lower than a typical software company's return, Nies disclosed.

However, Cincom derives its income in a way generally associated with hardware companies — through rental.

Status '81 Conference To Begin Its Circuit

PALO ALTO, Calif. — Integrated Circuit Engineering Corp. will present its annual conference, "Status '81 — A Report on the Integrated Circuit Industry," here at Ricky's Hyatt House starting tomorrow.

Subjects to be discussed at the two-day event include the worldwide business climate, a forecast of semiconductor production/consumption, key applications and trends and key technologies.

Attendees will receive prepublication copies of the firm's Status '81 book, the vendor said.

The Status '81 conference will also be held in New York's Travelodge International/JFK hotel Feb. 10-11. The conference costs \$195, the vendor said from 15022 N. 75th St., Scottsdale, Ariz. 85260.



CW Photo by M. Blumenthal
Dennis Yablonsky

Some 65% of the firm's users rent the software and 95% of new customers opt for this arrangement, noted Dennis Yablonsky, international sales manager.

Yablonsky credited this strategy as being instrumental in assuring Cincom's financial health.

Although the company's success is rooted to its Total and Environ/1 systems, Nies views these as the foundation of the company rather than its ultimate goal.

Over the past several years Cincom has built on this foundation by introducing facilitative products such as an on-line query and data entry systems. More recently the firm has added another layer to its product family by introducing applications packages, a manufacturing package and a financial system.

While bringing products to market early has been a key to Cincom's success, the firm is not adverse to acquiring product technology from outside the firm. Mantis was developed by a person not associated with the company.

And, Cincom's Epoch financial management system was developed by a Scandinavian company.

Multisystem Use

Although most of the firm's products are designed to be run on large IBM systems, Total can be run on 28 processors under 40 operating systems.

Through its Ventures Division, Cincom will adapt its products for other vendors' equipment.

For example, Cincom has adapted its Total system for NCR's VRX operating system and has adapted its data dictionary for some of Sperry Univac's systems.

These vendors do the marketing for Cincom and Cincom does the development, receiving a royalty fee from the vendor, Yablonsky explained.

As for the future, Nies is adamant about obtaining recognition from users that software is the investment portion of the budget, while hardware is an expense — the opposite of the view widely held today.

That view will change, though, Nies declared, as IBM will find it increasingly difficult to compete against the Japanese for hardware sales.

Consequently, IBM will step up its emphasis on software development, making Cincom's strategy of being two to four years ahead of IBM even more important during the 1980s, Nies noted.

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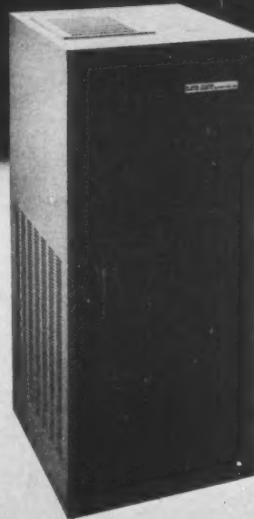
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Report Sounds PCM Alarm Over IBM Policy

(Continued from Page 85) as "dramatic" an industry impact as the firm's only other major software unbundling, which occurred in June 1969, the study predicted.

"Yet because of the gradual and somewhat 'sneaky' way in which the new unbundling was achieved, the public and the industry do not seem to have grasped its full significance," the report concluded. "It appears that the smaller

PCMs such as Magnuson, IPL Systems, Inc. and Two Pi will be severely impacted by the new software strategies."

Local Support

Another IBM product move that will likely have a profound impact on the PCM ranks is the recent unbundling of the industry giant's local support. Before the 4300 series' arrival on the scene, local support of SCPs was provided

free of charge to all IBM users and was available to PCM customers at the discretion of local IBM service offices.

Today, by contrast, local support of SCPs is available to IBM users only for a price and is no longer offered to PCM customers under any circumstances. Of course, PCM installations can still gain access to local support for all their PPs, but under IBM's revised service strategy, the com-

pany's PSRs are required only to make their "best effort" to correct bugs in a non-IBM user's licensed programs.

A third major IBM strategy change that casts a potential shadow over the PCM industry's long-term future is the recent formation of a Support Center that reportedly centralizes, streamlines and strengthens the firm's software-servicing capability. Many of the industry's other

vendors have recently tried to follow IBM's lead and establish Support Center-like facilities of their own.

But most of these IBM competitors, the study said, "lack the sophisticated, computerized problem-reporting and problem-tracking data base system, which is the backbone of the Support Center concept."

Challenging Future

IBM's triple whammy of unbundled operating system, tight restrictions on local support and the creation of a software Support Center means that, in general, the company's PCM rivals face a highly risky and challenging future. On the other hand, a few market forces will probably continue to work in the PCMs' favor.

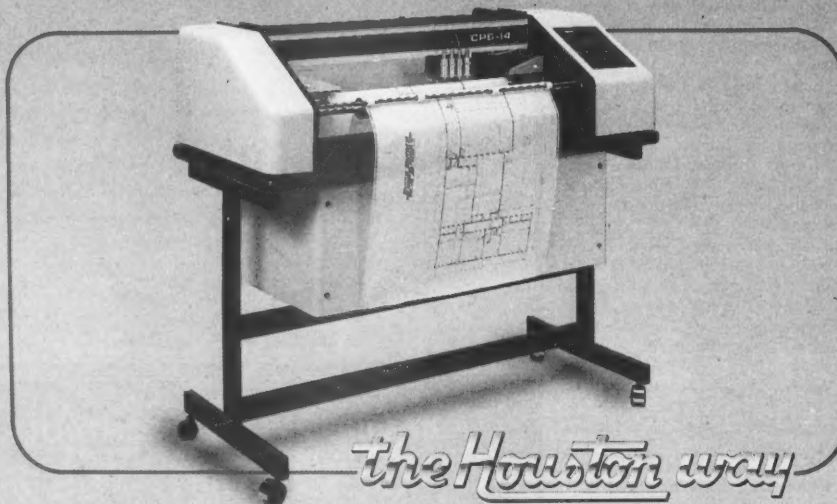
One of the possible bright spots on the PCMs' business horizon is that IBM still suffers from unacceptably long delivery lead times, especially for its Model 4341.

Another "plus" on the PCM side of the ledger is the possibility that the unbundling of IBM's operating systems and local support could give rise to a whole new industry — the "third-party software maintenance field." The advent of such an industry would parallel the rise of the third-party hardware maintenance sector and would probably go a long way toward alleviating the PCMs' current software-support shortcomings, the report said.

Unfortunately for the PCMs, the emergence of a third-party software maintenance industry hinges on significant changes in IBM's existing software copyrights, the study added.

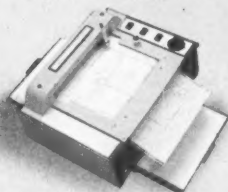
More information about the report is available from Strategic Business Services at Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

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Contracts

Mannesmann Tally Corp. and Commodore Electronics have reached an agreement for the supply of high-quality professional printers to be used on the CBM 8000 Series.

Planning Research Corp. has been awarded the initial \$15 million increment of an estimated \$20 million fixed-price subcontract by Burroughs Corp. for software support on its Air Force Phase IV contract.

Century Data Systems, Inc. has signed a renewal contract to provide 500 Trident Disk Drives to the minicomputer peripherals division of the Braegre Corp. over a two-year period.

IBM Reports '80 Earnings Up 18%, Revenues Up 14.7%

(Continued from Page 85)

roids of 1979. The volume of purchase activity in the fourth quarter was greater than had been anticipated earlier in the year," Opel observed.

"The favorable earnings resulting from high purchase volumes and the lower effective tax rate were diluted by continuing strong inflationary pressures."

IBM made a provision for income taxes for 1980 of \$2.3 billion compared to \$2.5 billion last year, a decrease of 8.1%.

Opel said that in spite of a tight economy, incoming orders and shipments

continued at high levels and showed moderate growth over 1979 levels, with the year-end backlog increasing over that of last year.

Sales of equipment totaled \$10.9 billion for the year, a 15.3% increase from 1979 levels. Revenue from rental and services reached \$15.2 billion for the year, yielding a 14.2% increase. The ratio of sales of total revenue was about 41.6%, relatively constant with 1979.

For the year the company experienced exchange gains of \$24 million compared to losses of \$52 million last year. The gains were primarily the result of the translation of assets and liabilities recorded in currencies other than the U.S. dollar

NCR Net Rises 18.5%, Revenues 10.6% in 1980

DAYTON, Ohio — NCR Corp. reported a 10.6% increase in revenues and an 8.5% increase in earnings for fiscal 1980.

During the last quarter, revenues rose 9.8% to just over \$1 billion, up from \$987.8 million in the final quarter of 1979.

Earnings for the period grew 20%, reaching \$117.9 million or \$4.38 per share, up from \$98.3 million or \$3.67 per share earned in the comparable period of 1979.

For the entire year, NCR's earnings reached \$254.6 million or \$9.50 per share, up from \$234.6 million or \$8.78 per share in 1979. However, pretax income grew 4.4%.

Revenues for 1980 totaled \$3.3 billion, up from just over \$3 billion in 1979.

Commenting on the results, NCR Chairman William S. Anderson said the company's incoming business declined in the fourth quarter, compared with the year-earlier period.

"Based on current backlogs and product availability, we are anticipating increased revenues and earnings during the early part of 1981. Results for the year as a whole, however, will depend to a considerable degree on business conditions in the U.S. and the extent of economic slowdowns elsewhere," Anderson said.

Nickels & Dimes

Datapoint Corp. has announced a two-for-one stock split of the company's common stock, to be effected in the form of a 100% stock dividend. The stock split will be issued Feb. 6 to stockholders of record Jan. 16.

\$\$\$

Scan-Data Corp. has announced the conclusion of an agreement with Control Data Corp. restructuring the debt and equity arrangements between the two companies, whereby Control Data will own approximately 31% of the common stock of Scan-Data.

\$\$\$

Dest Data Corp. has completed a private equity placement totaling \$3.4 million. The proceeds of this offering are for the retirement of short-term debts and will provide working capital to finance company growth.

\$\$\$

Thomas Foley, president of Visual Technology, Inc., and Daniel Holland, president of the Massachusetts Capital Resource Co. (MCRC), announced MCRC's investment of \$1 million in the Andover, Mass.-based video terminal manufacturer.

\$\$\$

EG&G, Inc. has increased its quarterly dividend to 12.5 cents per share of its common stock. The increase, up from 10 cents, is payable Feb. 2 to stockholders of record Jan. 16.

\$\$\$

Comshare, Inc. has issued a common stock offering of 660,000 shares and has received net proceeds in excess of \$10.2 million. The shares sold for \$16.62 each.

\$\$\$

AW Computer Systems, Inc. has completed its initial public offering of 100,000 common shares of company stock, which comprise approximately 5% of the equity of that firm. The stock sold at \$4.00 per share.

\$\$\$

An investor group headed by Gerard Currie has recently completed an agreement with Centigram Corp. to provide \$1 million in funding to that organization.

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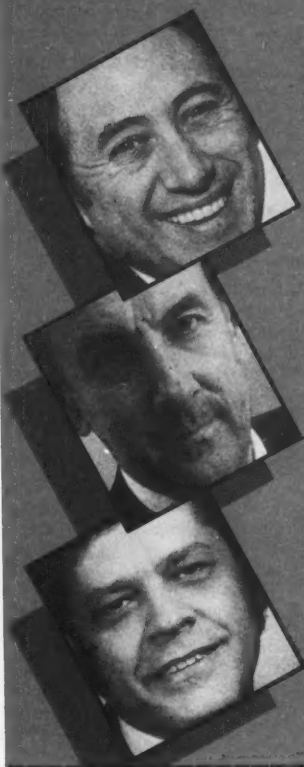
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Burroughs Plans Expansion Of Component Operations

DETROIT — Burroughs Corp.'s Components Group is planning to expand its engineering and manufacturing facilities in Jacksonville and Coral Springs, Fla., by an additional 180,000 sq ft of plant capacity.

This will enhance the group's capabilities to produce power supplies, interconnection devices and other electronic components for use in Burroughs DP products, Burroughs said.

Burroughs will build a 100,000 sq-ft facility in Jacksonville on a 42-acre site it recently purchased in the Argyle Forest development. Current plans call for groundbreaking to occur during the spring of 1981 with occupancy scheduled for a year later. Approximately 300 engineering, manufacturing and administrative personnel will be employed.

In Coral Springs, Burroughs will construct an 80,000 sq-ft facility on a site which adjoins its present facility.

Groundbreaking will occur this month with completion scheduled for late 1981; approximately 400 people will work in the new building.

Expansions

proximately 400 people will work in the new building.

Other Moves

Computer printer manufacturer **Integral Data Systems, Inc.**, has moved its headquarters from Natick, Mass., to a newly constructed 60,000 sq ft building in Milford, N.H.

Visual Technology, Inc. has expanded its operations into facilities at 540 Main St., Tewksbury, Mass. 01876.

Megatek Corp. has enlarged its corporate headquarters in the Sorrento Valley area with the addition of 10,000 sq ft of space in an adjacent building.

Circle Computer Services, Inc. has recently opened an office in Tokyo, to extend its engineering and modification services to the Far East.

Chapman Named Counsel for CCIA

WASHINGTON, D.C. — John Haven Chapman has been appointed vice-president and general counsel of the Computer & Communications Industry Association (CCIA).

He will have responsibility for CCIA's pending appeal of the Federal Communications Commission's recent final decision in the Second Computer Inquiry.

Chapman was recently senior trial counsel with the U.S. Department of Justice's Antitrust Division in the U.S. vs. IBM antitrust suit.

Meet to Address Computer-Based Ed

CHICAGO — A national technology-assisted learning industry conference, "Interfacing Industry Components," will be held at the Holiday Inn/Mart Plaza here Feb. 19 and 20.

Sponsored by the Technology-Assisted Learning Market Information Service (Talmis) of Educational Programming Systems, Inc. of St. Louis, Mo., the program will address some of the concerns faced by firms currently participating in computer-based educational products and services, or planning to.

Besides a technological exhibition, the conference will feature 12 sessions. A fee of \$450 includes refreshment breaks and lunches for the two days, according to a spokeswoman at Educational Programming Systems, 1328 Baur Blvd., St. Louis, Mo. 63132.

Small Business Guide Lists Federal Contacts

SUFFERN, N.Y. — The 1981 *Small Business Directory of Government Contacts* listing 1,000 small business specialists within the U.S. Department of Defense and major ci-

vilian agencies has been released by the Danbury Press.

The 72-page directory, designed for small and minority businessmen, lists subcontract specialists in state as well as federal government offices by name, address and phone number.

The directory is available at \$15 per copy plus 75 cents handling from the Danbury Press, P.O. Box 613, Suffern, N.Y., 10901.

A companion manual *How to Get Started in Government Business*, is also available at \$25 per copy plus \$1 handling.

'Infosystems' Forms Committee for Meet

CHICAGO — *Infosystems* magazine has formed a Program Advisory Committee for its second annual Software Info Conference, scheduled here Sept. 14-17.

Robert V. Head, a federal executive fellow with Brookings Institute, will chair the committee, which is aimed at monitoring the overall direction of the program.

The Software Info Conference will be held as part of Infosystems National Software Package Conference & Exposition at the Merchandise Mart Expocenter here.

Medical Group Sets Tour of Hanover Fair

BOSTON — The Institute for Medical Record Economics, Inc. is sponsoring a guided tour to the Hanover Fair in West Germany.

The tour leaves from Boston on the evening of March 28 and returns April 5. The cost, including air fare, accommodations, meals, workshop fees and admission tickets is \$1,980 per person.

Deadline for registration is Feb. 20 with the Institute for Medical Record Economics, Inc., P.O. Box 263, Cambridge, Mass. 02141.

Comdex/Spring Expo Slated for New York

FRAMINGHAM, Mass. — A Comdex/Spring conference

and exposition will be held in New York City in June 1981 at a date and site to be determined, according to the show's sponsor, The Interface Group.

The Comdex/Spring results from the large industry growth and will be held in addition to the Comdex '81 conference and exposition, already scheduled for the third year in Las Vegas Nov. 19-22.

Time and date for the new show will be announced soon. More information is available from Comdex/Spring, The Interface Group, 160 Speen St., Framingham, Mass. 01701.

Demos Planned For DEC Users

ORANGE, Calif. — The 1980 "DEC-Compatible Shows," a series of one-day product demonstrations for Digital Equipment Corp. users, has been extended for 1981.

The shows, which are sponsored by MDB Systems, Inc., will be expanded from this year's base of Pittsburgh, Washington, D.C., and Chicago to include Seattle, San Diego, New Orleans, Cleveland and Syracuse.

MDB is located at 1995 North Batavia St., Orange, Calif. 92665.

Amda Sets Locale, For 1981 Convention

SAN DIEGO — The 1981 convention of the Accounting Machine-Minicomputer Dealers Association (Amda) will take place here on March 18-22.

Amda is composed of approximately 150 independent equipment dealers located throughout North America. Last year, the group chose Diablo, Micro V Corp., Cado Systems and Commodore Business Systems to display their wares at its Toronto convention.

Admission to the event is \$55. Interested parties can obtain further details from Bill Keith at 85 Woodcrest Lane, Elk Grove Village, Ill. 60007.

Mergers/Acquisitions

Wespercorp has announced its agreement to acquire Data-systems Corp. in exchange for stock of Wespercorp. Consummation of the transaction is contingent upon Data-systems' shareholder approval.

The assets of Computer Applications Corp. have been acquired by Pioneer Hi-Bred International, Inc. for an undisclosed cash amount.

EG&G, Inc. and Chandler Engineering Co. have jointly announced that an agreement in principle has been reached for the acquisition of Chan-

der Engineering by EG&G through an exchange of common stock.

RCA Corp. has completed the sale of its Avionics Systems business to Sperry Corp. The purchase price is \$44.6 million, subject to certain adjustments.

Intersil, Inc. stockholders voted to approve the proposed merger with SUBGE Corp., a wholly owned subsidiary of the General Electric Co.

Ampex Corp. has become a wholly owned subsidiary of Signal Cos., Inc.

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Executive Corner



Ursula F. Fairbairn

Fairbairn Named VP at IBM DPD

WHITE PLAINS, N.Y. — Ursula F. Fairbairn has been named vice-president in charge of the management services staff in IBM's Data Processing Division (DPD).

Fairbairn joined IBM in 1966 as an instructor in the New York Education Center. She served in a number of marketing positions until 1973, when she was appointed a White House Fellow and executive assistant to the U.S.

Secretary of the Treasury.

She returned to IBM in 1974 and was appointed to a number of field and headquarters management positions. In 1978, she was named executive assistant to the chairman of the board of IBM.

The following year, she became group director, product programs and practices, Data Processing Product Group, headquartered in Harrison, N.Y. Fairbairn is a graduate of Upsala College and received a Master of Arts degree from Harvard University.

Other Moves

- Edward M. Lee has been promoted to president of the newly formed Information Technology Group of Indian Head, Inc.

- Colin I.W. Baxter has been elected president and chief of operations at The Foxboro Co. and executive vice-president Charles A. McKay has been named to the board of directors.

- James Finke has recently been appointed president and chief operating officer at Commodore International Ltd. Jack Tramael has simultaneously been named vice-chairman of the board and chief executive officer.

- Robert S. Scheidemantel Jr. has been appointed president of Sweda International, a Litton Industries affiliate.

- Brigadier General H.R. "Johnny"

Johnson, USAF (retired), has joined Vitalink Communications Corp. as a founder, with duties of a senior vice-president of marketing.

- Frank J. Iazzetta has been named vice-president of marketing for International Memories, Inc. He joined the firm from Century Data Systems.

- Bruce D. Smith has been elected vice-president of planning and new ventures of Comsat General Corp.

- Paul Ebeltoft has been appointed vice-president of sales for Bowne In-

formation Systems, a computer text processing services firm.

- Patrick E. Elmendorf has been named vice-president of operations of Corvus Systems, Inc.

- Perry G. Constantine, formerly of Fairchild Camera and Instrument Co., has been named vice-president of marketing for Eaton Corp.'s semiconductor equipment operations.

- Dave Stallard has been appointed vice-president of engineering at Zentec Corp.

If you're confused about computer power conditioning, you should be!

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Supershorts

Stockholders of Microform Data Systems, Inc. have approved a change in the corporate name to Icot Corp., effective immediately. The Mountain View, Calif. firm manufactures communications processors, intelligent terminals and interactive micrographic systems.

The directors of the Institute of Electrical and Electronic Engineers have elected Dennis J. Picard a fellow, the highest grade of membership in that professional society. Picard is a vice-president of Raytheon Co., in the equipment division in Wayland, Mass.

Shugart Associates has signed an agreement licensing Flexidisk Tecnologia Electronica S.A. to manufacture and market its floppy disk drive products in Brazil.

The National Computing Centre Training Library of England has been selected by Sperry Univac as a means of standardizing their customer training program in systems analysis throughout the world.

Symbol Technologies, Inc. has recently formed an overseas subsidiary, Symbol Technologies International, in Brussels, Belgium, to handle the European demand for bar-code scanners.

Consumer Computer Marketing, Inc. (CCM) has signed an 18-month marketing contract with Cromemco, Inc. under which CCM will serve as

Cromemco's major distribution arm east of the Mississippi River.

Apple Computer, Inc. has announced a computer literacy program, named "Apple Seed," which will provide certain elementary and high schools with computer course materials. The new program will be launched in February in the U.S. and Canada.

BASF Systems, formerly a division of BASF Wyandotte Corp., has become a separate entity within the BASF Group. Its new name is BASF Systems Corp., and it will operate as a wholly owned subsidiary of BASF America Corp.

The Data Products Division of R.H. Cole Electronics Ltd. has been acquired for more than one million pounds by Codex Corp. and Motorola Ltd., two wholly owned subsidiaries of Motorola, Inc. It is now called Codex U.K. Ltd.

A 14-member Honeywell Technology Board has recently been formed to coordinate, plan, fund and execute solutions to pervasive technology issues companywide.

Trend Communications Ltd., a \$20 million subsidiary of the Phicom Group, a U.K. firm, has announced that it is changing the name of its recently acquired U.S. peripherals company, the Drillick LaManna Corp., to Trend-DLC, Inc., effective immediately.

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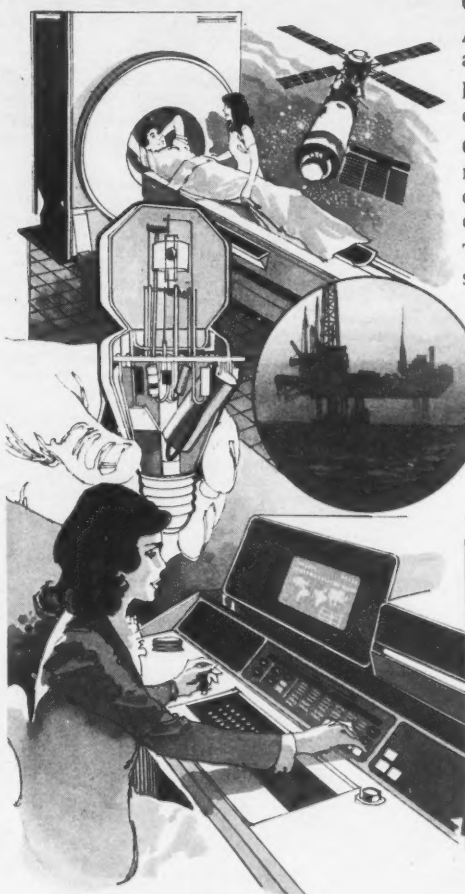
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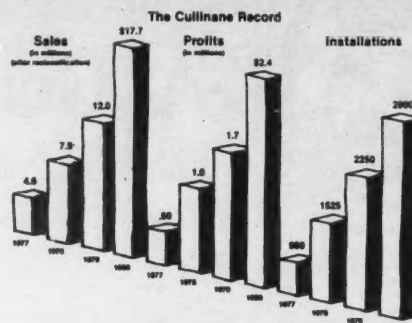
Requires minimum 2 years' programming experience; strong Assembler or COBOL skills; database or data communications experience required.

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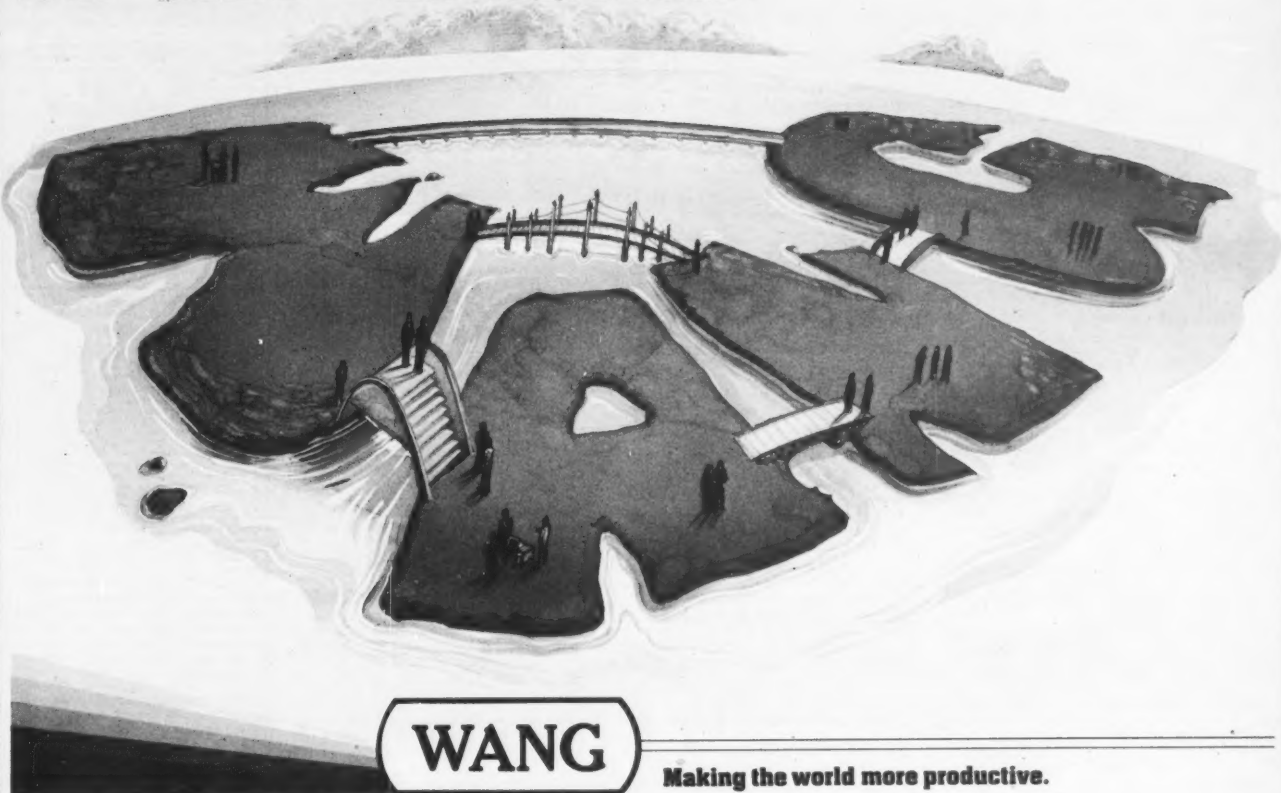
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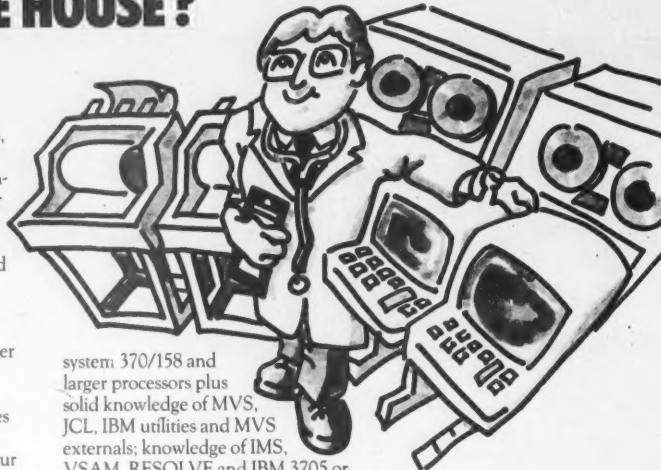
Field Engineering—two to five years experience in maintenance of large IBM mainframes or PCM's.

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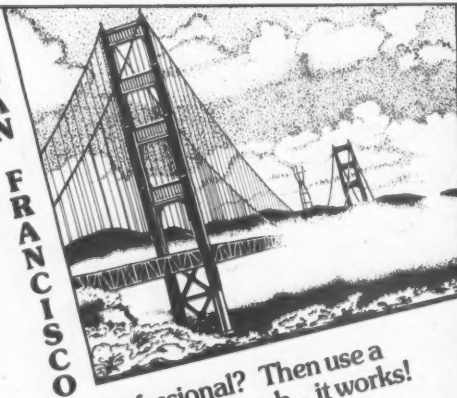
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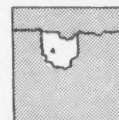
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Degree in business administration or accounting, two years each EDP auditing and data processing or audit experience required, coupled with an exposure to data base inquiry language and solid communications skills. Familiarity with IBM 380 or 370 large-scale computers and large communications network experience would be assets. Travel involved (10 - 20%).

Attractive compensation and outstanding benefits accompany this position, plus advancement opportunities. For consideration please send resume and salary history in confidence to:



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The successful candidate will have the following qualifications:

- Five to ten years of data processing experience, including experience in data base design and on-line systems;
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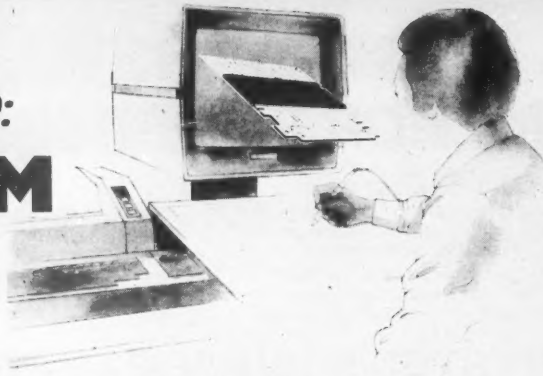
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Senior Programmer

A leading computer design and manufacturing corporation in the field of CAD/CAM seeks a Senior Programmer. Duties include: heavy involvement with an N/C post processor, including the preparation of technical documents to customer specifications, simulating machine situations with interactive graphic system, testing and maintaining N/C post processor according to new versions of systems packaging and creation of adaptive control systems and machinability sub-overlays. Minimum requirements include MS in Mechanical Engineering with 1 year experience at assistant engineer level in the area of manufacturing and machine tools; knowledge of N/C machine tools and their programming in APT, knowledge of manufacturing processes and engineering design/drawing; ability to program in FORTRAN/BASIC; apply high-level mathematical and documentation skills. Salary \$20,000 per year.

Please send resume to Joseph Sommers, ComputerVision Corporation, 201 Burlington Road, Bedford, MA 01730. An Equal Opportunity Employer.

SYSTEM ANALYST (Data Processing Manager)

MA in Computer Science or BA in Computer Science with experience. Experience with DEC PDP 11 family; good understanding of Basic language. Knowledge of medical or health facilities MIS preferred. Experience in supervising a Data Processing Center Operations. Ability to perform job cost analysis; ability to design computer systems request from non-technical users. 8:00 AM to 5:00 PM Monday through Friday, some weekends and some nights. For more information apply at Austin-Travis County Mental Health Mental Retardation Center, 1430 Collier, Austin, TX 78704 or call (512) 447-4141 Ext. 20.

EOE

A NEW APPROACH AT COCA-COLA USA Manager - Decision Support System

The continued growth of our headquarters facilities in Atlanta has created a new position within our Management Information Systems Department. Unlike the traditional data processing jobs, this position will uniquely blend an individual's managerial, technical, business and creative skills. The position will allow the selected candidate to develop a staff that will be responsible for the planning and implementation of top management requests for information. The person's primary responsibility includes developing broad based decision support systems that are data base oriented for problem analyses or strategic planning in the areas of finance, distribution and marketing.

We are looking for a candidate who can meet the following requirements:

- Degreed on the graduate level with 3-5 years of related professional experience.
- Experience in using modeling, financial and/or marketing planning techniques on IBM hardware.
- Ability to approach problems as a business person.
- Excellent communication skills.
- Experience in management and staff development.

This is a challenging slot that will afford the right individual an opportunity to make an outstanding contribution to our organization.

We offer an excellent income commensurate with your experience and generous benefits package. For immediate and confidential consideration, please forward your resume with salary history to:

Department R

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A Division of The Coca-Cola Company

Employment/Placement Office
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UNIVERSITY OF HARTFORD

Invites applications and nominations
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DIRECTOR OF ACADEMIC COMPUTING

The University of Hartford is an independent, coeducational, non-sectarian urban university, founded in 1877. The University is located in Connecticut, minutes from downtown Hartford, on an attractive 200-acre campus. It consists of eight colleges, offering over 70 major areas of concentration in liberal arts, engineering, business, education, music, art, and electronic technology. Approximately 4,200 full-time undergraduate, 3,200 part-time day and evening undergraduate, and 2,800 full- and part-time graduate students are enrolled at the University. Of these, 1,800 reside in modern dormitories filled to capacity.

The University of Hartford has recently ordered a Digital Equipment Corporation VAX 11/780 computer system. In addition, a new computer center is planned for construction in the near future. We seek a dynamic and competent individual to provide the necessary leadership to develop and direct an academic computing facility. This Director will report to the Provost and work with an Academic Computing Advisory Committee. The requirements for the position include:

1. Master's degree required - Ph.D. in appropriate discipline preferred. A faculty appointment is possible.
2. Experience with the operation of an academic computer center.
3. Experience with DEC equipment and/or VAX 11/780 computer preferred.
4. Ability to organize and run faculty workshops.
5. Knowledge of several computer languages and educational software packages.
6. Good sense of humor and effective interpersonal skills.

Applications including a resume, description of present position, and three references should be received by May 15, 1980. Respond to:

Dean James S. Vinson
College of Arts and Sciences
University of Hartford
West Hartford, CT 06117

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ASSOCIATE DIRECTOR VIRGINIA TECH COMPUTING CENTER

The Virginia Tech Computing Center has an IBM 3032, an IBM 370/158 AP, an IBM 4341, and a Honeywell 68/60 Multics System. The Associate Director will be part of the senior management team of the Center.

Duties to include interaction with instructional and research faculty on needs ranging from special purpose laboratory mini and micro computers to large scale batch, interactive computing, and word processing. Position is primarily administrative, but can provide for a limited amount of instruction and/or research activity, if so desired. Preference will be given to candidates with a Ph.D. in Computer Science, Engineering, or related field. Management experience in a large computing center is considered essential.

Salary for this position is open and commensurate with the selected candidate's qualifications and experience. Reply in confidence with resume and salary expectations to:

Dr. Vinod Chachra, Director
University Computing Resources
115 Burruss Hall
Virginia Tech
Blacksburg, VA 24061
(703) 961-4381

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Salary based on education and experience. Excellent fringe benefits. Requires any combination of training, education and experience providing competence in the job responsibilities including advanced courses in computer programming. Experience in programming using BASIC+ and some business applications programming experience required. Knowledge of interactive terminal oriented computer systems preferably DEC PDP-11 Series. Apply to **Director of Personnel, Arizona Western College**, P.O. Box 925, Yuma, AZ 85364 or 903/728-1000, ext. 222

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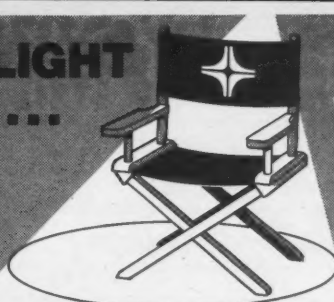
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Five years ANS COBOL programming experience plus one year systems analysis and design. Working knowledge of Data Base Mgt. and Datacommunications. Salary \$2069 to \$2514 per month plus good fringe. Send resume by Feb. 2, 1981 to R.K. Petrat, Personnel Coordinator, Torrance School District, 2335 Plaza Del Amo, Torrance, CA 90509 213/533-4251.

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BREAK INTO THE MINI-COMPUTER FIELD by joining our software team to provide technical expertise outside the development organization and solutions to customer installed systems. With a willingness to learn about new products, you will gain a broad background in overall mini-computer software design and applications. BS degree in Computer Science required.

SHARPEN YOUR KNOWLEDGE OF DATA MANAGEMENT ARCHITECTURES by participating in the specification, design and implementation of a state-of-the-art, hierarchical file system. Discover how to integrate this system with the I/O and database management systems. BS degree in Computer Science required and minimum 5 years experience in systems design.

EXPAND YOUR OPERATING SYSTEM BACKGROUND to include our growing V77 mini-computer family. Work within our interactive, Pascal development environment to design and implement major new OS modules: scheduler/dispatcher, I/O resource management and memory management systems. BS degree in Computer Science required and minimum 3 years experience in operating systems.

STRENGTHEN YOUR SOFTWARE ENGINEERING SKILLS by having responsibility for defining user needs and writing statements of requirements in the area of configuration management and software development tools. Will lead a project team to implement tools defined. BS degree required in math or computer science and minimum 8 years experience to include mainframes. Also, a position is available with responsibility for developing, documenting and testing tools to be used during the software development process. Requires a BS degree in math or computer science and at least 4 years software development experience.

HEIGHTEN YOUR ABILITIES IN PRODUCT TEST AND ASSURANCE. You will design and develop tools to be used in assurance testing and performance measurements. Requires a bachelor's degree in computer science or math and 5 years experience including knowledge of machine language and operating systems.

ADVANCE TO A SORT/MERGE PROJECT LEADER in our programming languages area. The position involves project leadership developing a new sort/merge package to support new ANSI COBOL and stand alone requirements. The individual will have a strong technical background in sort/merge technology with at least 8 years experience, including 5 years in systems programming.

Our Software Development organization is heavily team oriented and is looking for key members who are eager to accept responsibility and move quickly into lead technical and managerial roles. Come, work with a team that is action oriented, and enjoys responding to a technical challenge. Interact with hardware developers to formulate new systems architect concepts and design.

A position with Mini-Computer Operations offers you a stable, rewarding career, accompanied by a compensation package that is second to none in the industry, and includes free dental insurance, 10 paid holidays as well as a comprehensive medical and life insurance plan. Submit your resume and salary history in complete confidence to the address below, or phone our Employment Department at 714/641-7916 for additional information regarding these exciting career opportunities.

SPERRY UNIVAC

MINI-COMPUTER OPERATIONS

2722 Michelson Dr. • Irvine, CA 92713

A Division of Sperry Corporation and an equal opportunity employer M/F.

**DATA PROCESSING
MANAGER**

We are a growing progressive manufacturer of precision electronic instruments located on the northwest side of Chicago. We are seeking a shirt-sleeves professional with strong abilities to guide and supervise a staff of 6 programmer analysts. Because of the complexity of our systems, you must have strong technical capabilities in manufacturing and financial applications, using a 370/138 IBM DOS system. You must have demonstrated an ability to lead and help other programmers in the solution of sophisticated programming problems. ANS Cobol is our basic language and we also use DBOMP and WESTI. Since top management is vitally interested in our management information system, you must be able to communicate on a daily basis with them.

In return, we can offer you a dynamic atmosphere where your efforts and successes will be highly visible and amply rewarded.

This position is accompanied by an excellent salary as well as a complete fringe benefit package. To arrange a confidential interview, send your resume with salary history and requirements, to:

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Beltone

ELECTRONICS CORP.

4201 W. Victoria

Chicago, IL 60646

An Equal Opportunity Employer m/f

Data System Supervisor

Eranger Medical Center located in historic Chattanooga, Tennessee, is expanding its data processing operations as part of its long range system plan for an integrated medical information system utilizing main frame and mini-computer systems. We are seeking a "take charge individual" with supervisory experience and background in programming and operations of small scale or mini-computer systems. This individual will be responsible for supervising the daily activities of our data entry operations and upgrading our Four Phase IV-90 system to utilize concurrent processing in an MFE environment running VISION, WORD PROCESSING, OMS AND COBOL SYSTEMS. If you have Four Phase or similar systems experience this may be the ground floor opportunity you have been looking for. In addition to no state income tax and the warm hospitality and tradition of the south you will find a comprehensive benefits package and an outstanding opportunity for personal and professional growth. Don't delay. Submit a copy of your resume to:



Director - Data Systems
 Eranger Medical Center
 975 East 3rd St.
 Chattanooga, TN 37403

WYOMING**TELECOMMUNICATIONS/MINICOMPUTERS
PERFORMANCE ANALYSIS**

The University of Wyoming has an immediate need for a Telecommunications/Minicomputer Specialist in the Division of Computer Services. The person in this senior level technical position will be responsible for planning, coordinating, procuring, documenting and implementing all telecommunications activities for the University Computer Center. Additionally, this person will provide advice to University personnel regarding the best solution to their computational needs, and will be responsible for computer performance analysis.

The University has recently installed two large CDC CYBER computers which serve the campus and remote locations with batch and timesharing facilities. Currently, over 300 timesharing terminals are connected to this multi-mainframe system.

If you have at least six (6) years of progressively responsible computer experience, with a substantial portion related to minicomputer systems and telecommunications problem solving, some experience on large-scale mainframes, and a bachelor's degree in a computer-related field, we invite you to apply for this position. Good verbal and written communications skills are also essential.

The University, located in Laramie (population 25,000), enrolls 8500 students in a full range of Doctoral, Master, and undergraduate degree programs. We offer a competitive salary, commensurate with experience and education, and a full range of University benefits with this position.

If you would like to join us in this challenging position located in the Rocky Mountain region, please direct your resume (or inquiries) to David A. Haas, Manager, User Services & Academic Programming, Computer Services Division, University of Wyoming, P.O. Box 3045, University Station, Laramie, WY 82071. Telephone 307-799-4980.

The University is an active Equal Opportunity/Affirmative Action Employer.

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Rexham Corporation, a Charlotte based manufacturing firm listed on the NYSE, is expanding its Corporate Data Center to meet increasing user demand for high quality on-line systems. This expansion has created positions in the following categories:

SENIOR SYSTEMS ANALYST

Manage a small project team of programmers and analysts to develop and support on-line manufacturing systems written in ANSI 74 COBOL.

SENIOR PROGRAMMER ANALYST and PROGRAMMER ANALYST

Design, code, test, and implement major on-line manufacturing systems through direct interaction with users.

SENIOR SYSTEMS PROGRAMMER

Development and support of systems software in BAL as a member of strong technical support group.

These positions require at least 2-5 years' experience in development of on-line systems, based on the level of the position, and in general, have the following additional requirements:

- strong math background, with BA in Math, Computer Science, or Engineering; Master's a plus;
- skill in systems design, architecture, and user communications;
- considerable experience and facility with the ANSI 74 COBOL language (except Senior Systems Programmer);
- strong orientation toward technical competence;
- experience in the IBM 370/OS and/or UNIVAC 90/80-80 VS/9 environment.

As a member of this small core of computer science professionals, you will enjoy the challenge of working in an environment where technical skills are highly valued and rewarded. Our Data Processing Group is young and growing, through the sound development and implementation of high quality systems. The user and management relationship is very positive and productive, with considerable room for the creative individual. Our hardware environment is a UNIVAC 90/80-3 running VS/9 in support of over 50 on-line terminals, with movement toward distributed computing systems for some remote sites.

We offer competitive salaries and excellent benefits, including relocation reimbursement. Interested individuals are requested to send a resume, including salary requirements and position preference, in confidence to:

Personnel Manager

Rexham

CORPORATION

P.O. Box 4068, Charlotte, N.C. 28204

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SOFTWARE SALES AND SALES MANAGEMENT OPPORTUNITIES. CANDLE CORPORATION - The Developers of OMEGAMON.

Candle Corporation is growing rapidly. With this growth, a number of positions have opened in the Sales and Sales Management areas. The positions work with accounts which are located throughout the country. However, emphasis is being placed on finding people who are located in, or are willing to re-locate to Los Angeles or Orange County, California. Travel is not required.

DOS

Performance Monitoring Software Sales Representatives. Must have 2-5 years of software selling experience in the DOS market. Excellent salary, commission structure and advancement potential.

MVS and CICS

Performance Monitoring Software Sales Representative positions open for Sales Reps, Senior Sales Reps and Account Managers. Should have MVS or CICS experience. Excellent salary, commission structure and advancement potential.

SENIOR LEVEL SALES MANAGER

Must have 5 to 10 years experience in Software Sales and Sales Management. In-depth knowledge of the DOS, MVS and CICS Marketplace. International experience a plus. Excellent executive compensation package. Advancement potential to V.P. of Sales possible within two years.

Excellent income, personal success, advancement opportunities and professional growth are available at Candle.

Write or call:
Richard Galea
Candle Corporation
4676 Admiralty Way, Suite 624
Marina del Rey, CA 90291
Phone: 213-821-2902

A-63

PROGRAMMER ANALYST

CNL, a rapidly growing computer service bureau with heavy emphasis on software development and sales is looking for an experienced Programmer/-Analyst. Minimum of 3 years experience with RPG II in an on-line environment. Salary \$28K+. If you are interested in a ground floor opportunity to join a rapidly growing company send your resume to:

Curtis L. Brown, President
COMPUTER NETWORK LTD.

P.O. Box 443
Farmington, MO 63640
314/756-4555

EDP SALES MANAGEMENT

Fox-Morris, nationally recognized as the leader in Data Processing sales/marketing placement, has current opp'ts with top quality, rapidly growing client co's including:

Software National Sales Mgr- Phila	\$70-75,000
Small Computer Reg Mgr Dealers-Phila	\$65-70,000
Data Common Regional Mgr-Chicago	\$85,000
Telecommunications Sales Mgr-Phila & Boston	\$55,000

Client co's pay all costs. Contact, in conf. Don Owens, 215/-561-6300, FOX-MORRIS PERSONNEL CONSULTANTS, 1500 Chestnut Street, Phila., PA 19102.

Dallas

System Software Personnel

Billion dollar electric utility company with centralized data center has immediate need for persons within the rapidly expanding corporate Information Services Department to test and install new or modified systems software.

Positions at multiple levels offer growth potential for professionals demanding challenge and opportunity. Present staff expanding to support installation of second 3033 with **MVS/SPI and 2** as well as 4300 distributive process network.

Present state-of-the-art IBM 3032 environment is **MVS/SE2, ACF/VTAM** with 600 CICS, ROSCOE, and TSO terminals.

Mail resume and salary history to Employee Relations Division, Management Recruiting Department.



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The Computer Resources Group, Inc. is a long-established (9 years), highly respected (150 leading companies utilize our services), and alert organization (our data bank of computer professional needs is unmatched in the San Francisco area).

Send us your resume today or call collect.

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Santa Clara, CA 95051 (408) 727-1658

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Rare opportunities exist in the Denver headquarters of a national cable television operator to contribute to the development and future growth of a centralized IBM Computer Center. Positions currently available include:

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COBOL, IBM OS and DOS, JCL and RJE background and 3-5 years programming experience required. College degree and conversion experience highly desirable.

COMPUTER SYSTEMS ENGINEERS

Requires 3-5 years programming experience in real time or interactive environment. FORTRAN and ASSEMBLY language a must.

Company offers competitive salary and benefits package. Please send resume and salary history to:

Employment Manager
AMERICAN TELEVISION & COMMUNICATIONS CORP.

160 Inverness Drive West
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Exceptional opportunities, now exist with the premier DMS 1100 consulting firm. If you have the experience and technical credentials in DMS 1100 then you owe it to yourself, to investigate the advantages of being an associate of our firm. As a consulting associate you will enjoy working with your peers in challenging and stimulating assignments while receiving a liberal salary and excellent benefits. You're invited to submit your resume to Data Base Management Associates, Inc.

2820 West Maple
Troy, MI 48064
Attention: Mr. John Klimek
(313) 849-3119

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Dramatic growth, expansion and internal promotions have created several excellent career opportunities for talented Data Processing Professionals with large systems software experience, preferably Burroughs B6000/7000 system.

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Minimum 2 years experience in

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Minimum 2-5 years experience in

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Burroughs provides excellent salaries and benefit programs and through our commitment to growth, we can provide you with the kinds of diversified, challenging positions that offer you the chance to work with an industry leader doing the kind of work you enjoy. Opportunities are available at our Paoli, Pennsylvania facility.

To apply, please send resume in confidence to:

Aileen Unger
Burroughs Corporation
P.O. Box 517, Dept. C-1-26
Paoli, PA 19301

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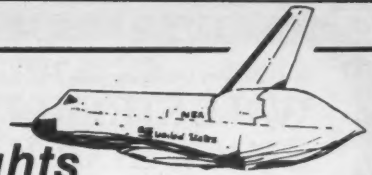
Several of our major blue-chip clients are currently in search of sales engineers to service technical, scientific and industrial markets in the New England area. Successful candidates will have 2-5 years sales experience in minis or micros, BSEE helpful but not necessary. Packages include high base plus commission, expenses and full benefits. Submit resume in confidence or call

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Bendix Field Engineering Corporation, a world leader in the service industry, has been awarded a contract in Saudi Arabia to provide technical assistance to the Presidency of Civil Aviation in the Maintenance and Operation of the Saudi Airways Facilities Systems. We have immediate requirements for candidates who are interested in challenging opportunities with experience in one or more of the following areas:

DATA SYSTEMS SPECIALIST

Requires BS or equivalent and six or more years experience related to computer software support for Air Traffic Control automation system and facilities.

COMPUTER PROGRAMMER ANALYST INSTRUCTOR

Requires a Bachelor of Science degree or equivalent and 5 or more years experience, of which 2 years must have been in programmer training, related to general computer programming or real-time data processing systems using Assembler language.

DATA PROCESSING INSTRUCTORS

Requires a Bachelors degree in Electrical/Electronic Engineering and 2 or more years of training experience related to the preparation of training material and formal classroom instruction in data processing equipment.

DISPLAYS INSTRUCTOR

Requires a Bachelors degree in Electrical/Electronic Engineering and 2 or more years of training experience related to the preparation of training material and formal classroom instruction in Alphanumeric radar displays.

DISPLAYS TECHNICIANS

Requires formal training and 3 years experience in Radar Display systems utilizing CRT digital displays and scanning displays.

DATA PROCESSING TECHNICIAN

Requires formal training and 3 years experience in high speed digital/analog electronic computers, microprocessors, data processing, data transfer, mpa and alphanumeric generator and display interface systems.

BENDIX offers competitive salaries, liberal fringe benefits, free housing, (some family accommodations), annual and rest and relaxation leave, hardship allowance and completion bonus. If interested, please submit resume in strictest confidence to:

Mr. Bill Stover
Professional Placement Office, Dept. ATC
Bendix Field Engineering Corporation
Subsidiary of The Bendix Corporation
9250 Route 108, Columbia, Maryland 21045
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Field Engineering Corporation**Information Systems Director**

Management, development, fiscal operating regional data processing center (IBM 370-145) serving internal department and 12 school districts. Supervise staff of 15. M.A. in administration, training in systems analysis, design, programming, data processing standards. Minimum 5 years experience, 3 in management of electronic information systems. Salary minimum \$31,110. Request applications: Ingham Intermediate School District, 2830 West Howell, Mason, MI 48854, 517/878-3288.

SR. SYSTEMS PROGRAMMER/ANALYST

Join the corporate data processing staff at National Health Laboratories in Dallas TX. Design, program, and install on-line data systems nationwide, utilizing Digital Equipment computers. Require college degree, preferably in Computer Science and 4 years experience. Desire mini-computer experience. Send resume to:

National Health Laboratories, Inc.
10300 N. Central Expressway
Meadow Park Central IV, Ste. 220
Dallas, TX 75231

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Data Processing Professionals:

WALL STREET IS TAKING STOCK IN OUR GROWTH SO SHOULD YOU!

It is no surprise that National Medical Enterprises has become one of the leading innovators in the health care industry in just 11 years. What is surprising is their incredible rate of growth which has far surpassed any previous expectations.

And that's good news for DP Professionals because NME is currently undergoing their most ambitious expansion to date and they're looking for top professionals who can take an active role in the expansion and development of the Data Processing Operations. NME has current needs for a:

PROGRAMMING MANAGER	COMPUTER OPERATOR
DATA COMMUNICATION ADMINISTRATOR	PRODUCTION CONTROL CLERK
MICROFICHE OPERATOR	SENIOR SYSTEMS ANALYST
APPLICATIONS PROGRAMMER	

OTHER POSITIONS ARE PERIODICALLY AVAILABLE

The candidates we seek must have academic and practical training as required by their particular area of expertise; familiarity with COBOL, IBM DOS/MVT equipment where appropriate, is a must.

Located in Los Angeles, NME offers an excellent compensation package including a competitive salary. We are an aggressive company on the move, so if you're looking to become a member of a result-oriented team, submit your resume to:

Corporate Employment Manager - Dept. R-100
National Medical Enterprises, Inc.
11620 Wilshire Blvd., Suite 740
Los Angeles, CA 90025

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E • RECOGNITION & REWARDS • STATE-OF-THE-ART HARDWARE**

For a satisfying and rewarding career that you've got to see to believe, come to Information Systems Division in Anaheim. The company that gives you the very best opportunities possible for career growth and achievement.

Right now, our large user base is expanding rapidly. As a result, we have exceptional career positions available for:

PROGRAMMER ANALYSTS	SR. PROGRAMMER ANALYSTS
SYSTEMS ANALYSTS	SR. SYSTEMS ANALYSTS

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Carter Hawley Hale Stores, Inc.
INFORMATION SYSTEMS DIVISION

Albert Quintanilla
INFORMATION SYSTEMS DIVISION
P.O. Box 1075
Placentia, CA 92670
(714) 520-1864

Equal Opportunity Employer M/F

Computer Professionals

Rensselaer Polytechnic Institute, a prestigious, technologically oriented private university located in beautiful upstate New York is expanding its network of timesharing terminals and distributed mini/micro computers using the IBM 3033 system. We are conducting a search for experienced individuals to actively engage in the following areas:

SPIRES DATABASE SUPPORT SPECIALIST

Will assist users in the design of databases using the SPIRES database systems on the IBM 3033. Experience in design and support of database systems and consulting experience required.

ENGINEERING APPLICATIONS CONSULTANT

Will enhance and support engineering applications packages on the IBM 3033, and will consult with customers concerning their proper use. Experience with applications package support and familiarity with engineering applications software is desirable.

APPLICATIONS SUPPORT SPECIALIST

Will enhance and support academic applications packages using the IBM 3033. Experience with applications package support in a university environment is desirable.

USER EDUCATION COORDINATOR

Will organize a variety of short courses for users of the 3033 and will teach some of the courses. Teaching experience, programming experience, and familiarity with a university environment required.

NETWORK AND COMMUNICATIONS SPECIALIST

Will participate in the design, implementation, and support of a communications network using a mixture of "ether" and X.25 technologies, using the IBM 3033 as one of several hosts. Previous communications and network design experience is required.

COMMUNICATIONS SYSTEMS PROGRAMMER

Will participate in the support and enhancement of communications software interfacing high-speed asynchronous terminals and computers to the 3033, and in the extension of this software to serve as a local multi-node packet switching network supporting several intelligent hosts and network interface machines. Knowledge of DEC PDP-11 assembler language and previous experience with communications hardware and software is required. Familiarity with pascal and IBM 370 assembler language is desirable.

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Position requires a BS degree in Computer Science, or equivalent with minimum of two years experience in the design and implementation of large Data Processing systems. Individual will serve as a team member to design and implement a new online accountability system. Responsibilities include interfacing with programmers and developing program specifications.

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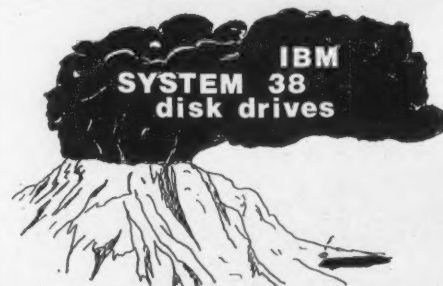
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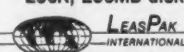
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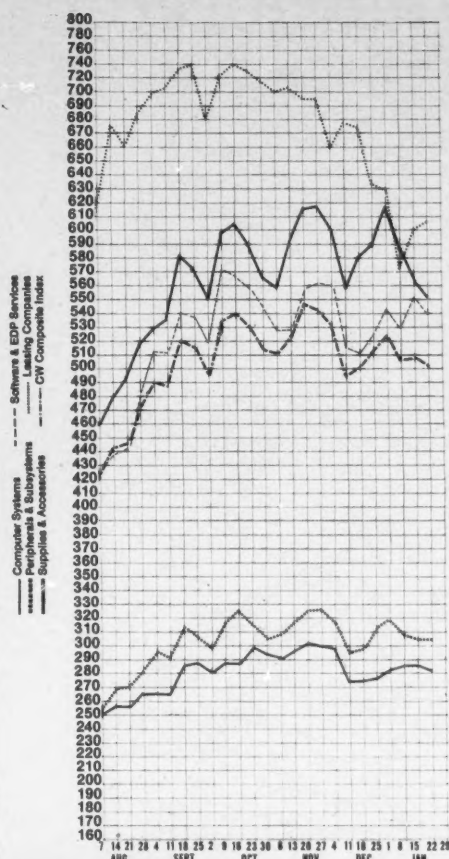
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		RANGE (1)	CLOSE JAN 21 1981	WEEK NET CHNGE	WEEK PCT CHNGE			RANGE (1)	CLOSE JAN 21 1981	WEEK NET CHNGE	WEEK PCT CHNGE			RANGE (1)	CLOSE JAN 21 1981	WEEK NET CHNGE	WEEK PCT CHNGE
COMPUTER SYSTEMS																	
A	ANDAHL CORP	15-42	28	+1/8	+0.4	O	ADVANCED CORP TECH	1-6	5	-3/8	-11.1	A	DATA ACCESS SYSTEMS	8-23	18 7/8	-1 1/4	-6.2
N	BURROUGHS CORP	47-88	48 3/8	-3 1/2	-8.7	O	ADVANCED SYSTEMS INC	12-15	13 1/2	+1/4	+5.8	A	DATAPRODUCTS CORP	11-38	33	+1/4	+0.7
O	COMPUTER AUTOMATION	8-27	15	-1 1/2	-8.0	O	ANACORP INC	7-24	18 1/4	+1/4	+1.3	O	DELTA INC	2-5	3 5/8	-1/4	-8.4
N	CONTROL DATA CORP	35-77	85 1/4	-1 1/8	-1.6	O	ANALYSTS INTL CORP	3-14	8 1/2	-1	-10.5	N	DECISION DATA COMPUT	2-6	4 3/8	-1/2	-10.2
O	CRAY RESEARCH INC	10-49	38 7/8	+2 3/4	+7.4	A	APPLIED DATA RES.	8-24	18 1/8	+1 1/4	+7.4	O	DELTA DATA SYSTEMS	1-3	1 7/8	+1/4	+15.3
N	DATA GENERAL CORP	46-87	52	-3/8	-0.7	N	AUTOMATIC DATA PROC	31-52	47	-2	-4.0	O	DATARAM CORP	8-37	10 1/4	-3/8	-5.7
N	DATAPoint CORP	44-119	100 1/2	-7	-6.5	O	COA COMPUTER ASSOC.	8-17	13 1/4	-1 1/2	-10.1	N	ELECTRONIC N & M	6-37	8 5/8	-1/8	-1.8
N	DIGITAL EQUIPMENT	52-88	84 5/8	+3/4	+0.8	O	COMPUTER HORIZONS	1-5	2 1/2	-1/4	-8.0	O	EVANS & SUTHERLAND	21-83	82 1/2	-2	-3.1
A	EEDC INC	8-17	15 1/8	+1/4	+1.6	O	COMPUTER NETWORK	4-8	6 1/4	-1/4	-3.8	O	FABRI-TEK	1-4	2 3/4	+1/8	+4.7
N	ELECTRONIC ASSOC.	8-12	7 1/2	+3/8	+5.2	N	COMPUTER SCIENCES	11-30	21	-1/4	-1.1	O	GENERAL COMPUTER SYS	1-8	8	+1/2	+30.8
N	FOUR-PHASE SYSTEMS	20-48	22 1/8	-1 3/8	-5.8	O	CULLINANE TASK GROUP	1-13	13 1/2	-1	-10.2	O	HEILITEX INC	8-22	17 1/2	+1/4	+1.4
N	FOXBORO	31-59	51	-1 1/2	-2.8	O	COMPUTER USAGE	2-10	8 1/4	+1/4	+3.1	O	GENERAL TERMINAL CP	1-4	1 5/8	-1/8	-7.1
O	GENERAL AUTOMATION	7-19	8 7/8	-1/8	-1.3	O	COMPUT AUTO REP SVC	4-11	7 1/2	-1/8	-1.8	N	HAZELTINE CORP	12-33	24 1/4	-1 3/4	-6.7
O	GRI COMPUTER CORP	1-3	1 1/2	0	0.0	O	CORSHARE	11-31	14 1/2	-1 1/4	-7.8	N	HARRIS CORP	25-35	30 1/8	+3/8	+0.7
N	HEWLETT-PACKARD CO	46-95	79 1/4	-5	-5.8	O	CULLEN TASK GROUP	1-13	13 1/2	-1/2	-1.4	O	INFORMATION INTL INC	8-15	11	-1/4	-2.2
N	HONEYWELL INC	65-115	101 1/8	-2 5/8	-2.5	O	DATA DIMENSIONS INC	1-6	1 3/8	0	0.0	O	INTEL CORP	23-30	38 1/2	+1/2	+1.3
N	IBM	50-78	85 1/8	-1 5/8	-2.4	O	DATATAB	1-4	1 1/8	0	0.0	O	INTERFIL	13-34	34	+3/8	+1.1
O	IBMADSON CORP SYST	20-46	37	-3 1/4	-8.0	O	DSI CORP	4-8	6 1/2	0	0.0	A	LUNDY ELECTRONICS	4-17	11 1/8	-1/8	-1.1
N	MANAGEMENT ASSIST	8-25	14	-1 1/4	-8.1	O	ELECTRONIC DATA SYST	19-38	36 1/4	-2	-5.2	O	MBI DATA CORP	5-16	13 1/8	-5/8	-4.3
O	MANUFACTURING DATA	22-80	70	-1	-1.4	O	INFORMATICS INC	8-25	23	+1 5/8	+7.8	N	MEMBER	10-34	10 3/4	-1	-8.5
O	MINI-COMPUTER SYS	2-8	6 1/8	0	0.0	O	INBYTE CORP	1-3	3 1/8	+3/4	+31.5	N	MONARK DATA SCI	10-31	31	-1/8	-0.3
O	MODULAR COMPUTER SYS	8-31	19	0	0.0	O	IPB COMPUTER MARKET	1-4	1	0	0.0	O	OMER	2-12	10	0	0.0
N	NCR	52-82	83 5/8	-4 5/8	-8.7	O	KEANE ASSOCIATES	3-8	5 3/4	-1/4	-4.1	N	PARADYNE CORP	8-34	34	+4 1/2	+15.2
N	PRIME COMPUTER INC	10-41	34 3/8	-1	-2.8	O	KEYDATA CORP	1-5	1 1/8	-1/8	-5.5	O	PERITEL CORP	9-18	15 1/8	-1 1/8	-7.8
N	PERKIN-ELMER	13-35	28 3/8	-1 1/2	-4.8	O	LOGICON	12-30	26 1/8	-1 3/4	-8.2	O	RAITEK CORP	10-23	18 1/2	-1/4	-1.3
N	SPERRY CORP	42-89	58	-3 3/4	-8.0	O	MATHEMATICA INC	5-18	13 3/4	-1 1/4	-8.3	O	RECOGNITION EQUIP	5-21	13 7/8	0	0.0
O	TANDEN COMPUTERS INC	13-76	85 1/2	-1/2	-0.7	O	MATHEMATICAL APP ORP	7-33	18	0	0.0	O	SCAN DATA	1-5	2	-1	-3.0
N	TEXAS INSTRUMENTS	78-150	113 3/4	-3	-2.8	O	NATIONAL DATA CORP	10-36	35 1/8	+5/8	+1.8	N	SCIENCE TECHNOLOGY	12-38	20 1/8	-3/4	-3.5
A	WANG LABS.	17-80	35 1/2	+3/4	+2.1	N	PLANNING RESEARCH	3-13	7 1/4	-1	-12.1	O	SYKES DATATECHNICS	14-30	35	-1	-2.7
LEASING COMPANIES																	
O	BOOTH FINANCIAL CP	13-27	19 3/4	-3/4	-3.8	O	PROGRAMMING & SYS	1-1	7/8	0	0.0	O	T BAR INC	14-24	18 1/4	-1 1/2	-7.5
N	COMDISCO INC	8-24	18 3/8	-1/8	-5.7	O	RAPIDATA INC	4-11	9 3/4	-3/8	-4.1	A	TEC INC	8-15	8 1/4	-1/8	-1.0
A	COMMERCE GROUP CORP	1-2	7/8	0	0.0	O	REYNOLDS & REYNOLD	20-34	21	-1 1/2	-6.8	O	TEKTRONIX INC	42-70	55 7/8	0	0.0
O	COMPUTER INVSRTS GRP	0-4	1/4	0	0.0	O	STSC INC	8-28	22 1/4	-3 1/2	-13.5	N	TELEX	3-8	4 3/8	-1/4	-5.1
O	CONTINENTAL INFO SYS	2-15	4	0	0.0	O	SCIENTIFIC COMPUTERS	3-17	12 3/4	-1 1/4	-8.8	O	TENATA SYSTEMS CP	8-26	10 5/8	-7/8	-7.8
N	DATRONIC RENTAL	3-5	4 1/2	0	0.0	N	TYNSHARE INC	17-30	43 3/4	+1 3/8	+3.2	O	TIMEPLEX INC	5-22	11	+5/8	+1.1
A	DCL INC	3-8	2 5/8	0	0.0	O	URS CORP	17-14	14 1/4	-1/8	-0.8	O	WILTEK INC	1-3	2 5/8	-1/8	-4.9
N	DFF INC	5-12	6	0	0.0	N	WYLY CORP	4-20	13 3/4	-7/8	-5.8	SUPPLIES & ACCESSORIES				E X C H	1980-81 C H
O	ITEL	1-15	3/8	0	0.0	N	AM INTERNATIONAL	13-24	13 3/4	+1/8	+0.8	A	AMERICAN BUS PRODS	8-15	13 3/4	-1/8	-0.8
O	LEASAP CORP	1-2	5/8	0	0.0	O	ANDERSON JACOBSON	8-25	21 1/4	+1/8	+0.8	O	BALTIMORE BUS FORMS	1-2	1 1/2	-5/8	-0.0
A	PIONEER TEX CORP	2-4	3 5/8	+5/8	+20.8	O	AUTO-TROL TECHNOLOGY	18-62	38 1/2	-2 1/2	-6.4	O	CYBERNETICS INC	1-2	1	0	0.0
N	RELANCE GROUP INC	24-78	68 1/2	+1 1/2	+2.2	O	BEEHIVE INT'L	3-36	30 1/4	+2	+7.0	O	DUPLEX PRODUCTS INC	11-18	13 5/8	+1/4	+1.8
N	U.S. LEASING	12-28	25 7/8	-1/8	-0.4	A	BOLT-BERANEK & NEW	12-37	32 5/8	+3/4	+2.3	N	ENNIS BUS, FORMS	13-21	18	-2 3/4	-1.5
PERIPHERALS & SUBSYSTEMS																	
N	AM INTERNATIONAL	13-24	13 3/4	+1/8	+0.8	O	BUNKER RAND	17-41	38 3/4	+2 1/4	+6.0	O	HOOR CORP LTD	27-37	33 5/8	-1/2	-1.4
O	ANDERSON JACOBSON	8-25	21 1/4	+1/8	+0.8	N	CAMBRIDGE MEMORIES	1-9	2 5/8	-1/4	-8.8	N	NASHUA CORP	20-35	26 1/8	+1 1/2	+6.0
O	AUTO-TROL TECHNOLOGY	18-62	38 1/2	-2 1/2	-6.4	N	CENTRONICS DATA COMP	18-55	20 1/4	-1 5/8	-7.4	O	STANDARD REGISTER	22-35	31 3/4	-2 1/2	-7.2
O	BEEHIVE INT'L	3-36	30 1/4	+2	+7.0	O	CETEC CORP	3-8	7 5/8	+1	+15.0	A	TAB PRODUCTS CO	8-30	30 3/8	1/4	+1.2
A	BOLT-BERANEK & NEW	12-37	32 5/8	+3/4	+2.3	O	COMPUTER DEVICES INC	1-10	8	-3/8	-4.4	N	WABASH MAGNETICS	11-31	30 1/4	+1/8	+0.4
O	BUNKER RAND	17-41	38 3/4	+2 1/4	+6.0	O	COGNITRONICS	4-10	2	0	0.0	N	WALLACE BUS FORMS	12-26	24	-1 1/2	-5.8
O	CAMBRIDGE MEMORIES	1-9	2 5/8	-1/4	-8.8	O	COMPUTER COMMUN.	4-10	2	0	0.0	EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH					
N	CENTRONICS DATA COMP	18-55	20 1/4	-1 5/8	-7.4	O	COMPUTER CONDS	4-28	21	-1/4	-0.0	L=NATIONAL HIGHEST; O=OVER-THE-COUNTER					
A	CETEC CORP	3-8	7 5/8	+1	+15.0	O	COMPUTER TRANSCEIVER	1-6	5 1/4	0	0.0	D-T-C PRICES ARE BID PRICES AS OF 3 P.M., OR LAST BID					
O	COMPUTER DEVICES INC	1-10	8	-3/8	-4.4	N	COMPUTERVISION CORP	24-92	71 1/2	+2 1/4	+3.2	(1) TO NEAREST DOLLAR					
O	COGNITRONICS	4-10	2	0	0.0	N	CONRAC CORP	13-25	18 3/4	+1/2	+2.7						

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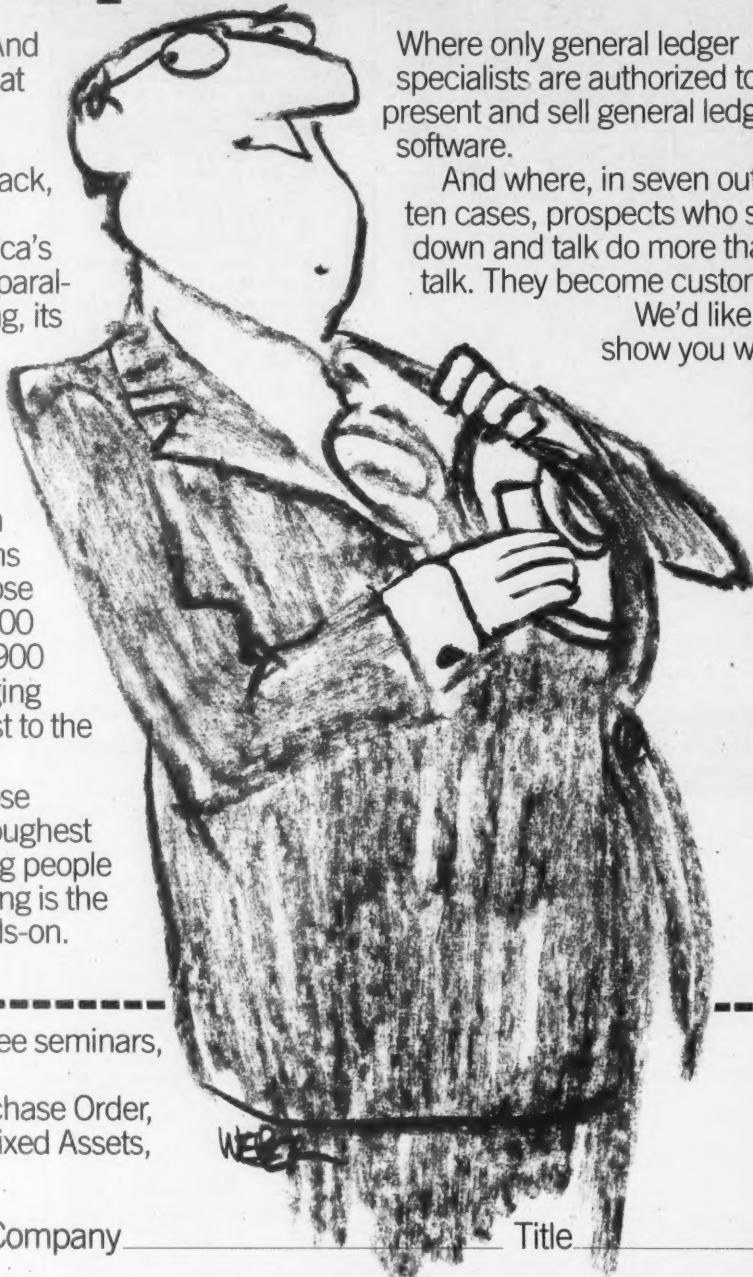
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